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TUBERCULOSIS IN THE CANADIAN ARMY 1939 TO 1944*

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ARMY experience provides an unusual opportunity to study some features of the epidemiology of tuberculous infection. On enlistment, each recruit is examined with the specific object of excluding significant tuberculous disease; cases developing on service are hospitalized and thoroughly investigated; on discharge, all soldiers are again examined and x-rayed for evidence of disease. Since several hundred thousand men have been enlisted and have been or will be discharged, the material for study will be large. Several publications on the incidence of tuberculosis in the Canadian Army have appeared.[1, 2, 3, 4]

Interest is added and opportunity for study increased by two circumstances in particular, namely:

1. The Provinces of Canada may be divided into two distinct groups in accordance with the prevalence of tuberculous infection. The death rate among the white population in 1941 in the four Prairie Provinces and Ontario ranged between 18.1 in Saskatchewan and 45.0 in British Columbia. In the four most easterly provinces the rates were from 67 in New Brunswick to 79.4 in Quebec. Recruits enlisted from these two regions would be expected to show different degrees of susceptibility.

2. The Canadian Army has, throughout the war, been divided into two separate parts roughly comparable in size. One part has remained in Canada and has been subjected to the same degree of tuberculosis contact that prevails in civil life. The other part has been sent to various countries in all of which the death rate from tuberculosis is higher than in Canada and where contact with open cases is more likely to take place.

For the above reasons, a comparison of the incidence of tuberculosis in the Home and Overseas Armies and also a comparison of the fate of Eastern and Western troops on going overseas should yield significant epidemiological information.

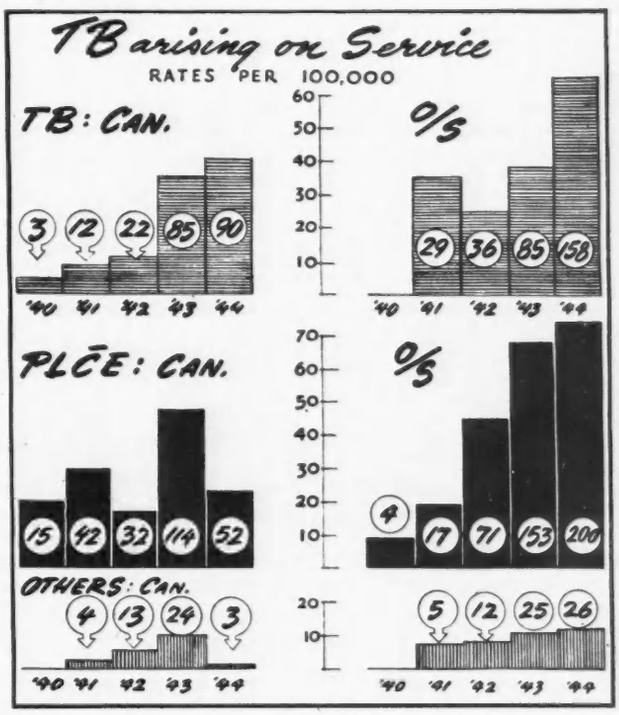

Fig. 1

Fig. 1 and Table I present a picture of the incidence of all tuberculosis for the years 1940 to 1944 inclusive in the two Armies. The figures for 1944 are estimated on the returns during the first nine months. The graph shows the rates per 100,000 and the figures in circles show the actual number of cases. Only cases that arose during service are included in this analysis. They were selected by an examination of all the films and all the files of personnel discharged because of any sort of tuberculosis. This involved nearly 4,000 files and about

* From Medical Directorate, National Defence Headquarters, Ottawa.

TABLE I.

SUMMARY OF CASES

SHOWING NUMBER OF CASES ARISING ON SERVICE OVERSEAS AND IN CANADA. RATES PER 100,000 OF AVERAGE ARMY STRENGTH SHOWN IN BRACKETS

	Pulmonary tuberculosis	*Pleurisy with effusion*	*Other forms*	*Total cases*
1940				
Canada..	3 (4)	15 (20)	0 (0)	22
Overseas.	0 (0)	4 (10)	0 (0)	
1941				
Canada..	12 (9)	42 (30)	4 (3)	109
Overseas.	29 (35)	17 (20)	5 (7)	
1942				
Canada..	22 (11)	32 (17)	13 (6.5)	185
Overseas.	36 (24)	71 (46)	12 (8)	
1943				
Canada..	85 (35)	114 (47.5)	24 (10)	486
Overseas.	85 (38)	153 (69.5)	25 (11)	
*1944				
Canada..	90 (40)	52 (23)	3 (1.3)	529
Overseas.	158 (66)	200 (75)	26 (11)	
Total number of cases—1,332				
Canada..	212	255	44	
Overseas.	308	445	68	

*Estimated on figures for first nine months.

10,000 films. Over 80% of these were available at the time of survey. The figures as they appear in this paper have been corrected for the deficiency. Pulmonary cases were judged to have arisen on service if the enlistment film was negative and if no previous history of tuberculosis could be discovered. Pleurisy was considered to be tuberculous if it appeared from history and films to be "idiopathic", or if proved to be tuberculous by culture.

Comparison of the rates in Canada and overseas produces the following facts:

PULMONARY TUBERCULOSIS

(*a*) The over-all incidence is seen to be higher in overseas troops. The total cases are: Canada 212, Overseas 308. The corresponding rates are: Canada 24, Overseas 40.* These rates are estimated to be 15 and 25% respectively of the civil incidence in the same age and sex groups.

(*b*) The rate in the Army in Canada has increased in a fairly regular way but with a particularly sharp increase in 1943. In overseas troops a sudden flood of cases took place in 1941 with a moderate general increase since.

* All rates quoted are based on the average Army strength for the period involved and expressed per 100,000 per year.

PLEURISY WITH EFFUSION

(*a*) The overseas incidence is, as in pulmonary tuberculosis, much greater than in the Army in Canada. The total cases are: Canada 255, Overseas 445. The rates are: Canada 30, Overseas 60. In comparison, the civil rates for Western Canada are estimated to be about 20.

(*b*) The rate for the Army in Canada from year to year is irregular. There is a peak in 1941 and another in 1943 extending above the other years, which run at a level of about 20. In contrast, the overseas rates increase in a rapid and regular manner reaching an estimated rate of 75 in 1944 which is two and a half times as high as the average rate in the Army in Canada.

OTHER FORMS OF TUBERCULOSIS

(*a*) Overseas rates are, in general, higher than those in Canada. The total numbers are: Canada 44, Overseas 68. The corresponding rates are 5 and 9. The numbers are probably too small to be significant. The rates are lower than usual civil rates. In 1939 the sanatorium admission rate in Manitoba was 14 and in Saskatchewan 27.

(*b*) There is a slight tendency to increase of rates from year to year but this also may be fortuitous.

EPIDEMIOLOGY

There are a number of circumstances that might contribute to producing the effects noted. In discussing possibilities each type of tuberculous infection in each Army will be discussed.

PULMONARY TUBERCULOSIS IN CANADA

(*a*) The increasing rate is likely due to several factors. More cases would naturally arise during each succeeding year after the enlistment film. Even though no contact with outside cases took place, there would be increasing incidence due to development of cases who had disease on enlistment which was too early to be discovered. Cases arising from outside infection would also come to light at a gradually increasing rate since the period between infection and manifest disease is frequently a matter of years.

(*b*) The apparent increase in rate in 1943 and 1944 over 1942 is partly due to increase in discovery rate rather than actual increase in incidence. Examination of suspects and contacts has become more thorough and cases are

found earlier in their course. This is attested by the fact that in 1942 only 27.6% of the cases discovered were minimal, while in 1943 and 1944 the minimal cases constituted 56.5 and 55% respectively of the total. This more vigorous search for new cases may, indeed, account for the greater part of the apparent increase.

PULMONARY TUBERCULOSIS OVERSEAS

The increasing rate may be due, in part, to the same causes that account for a similar tendency in troops in Canada, *i.e.*, lapse of time since the enlistment film and more careful search for cases in recent years. The latter reason does not apply with as much force in overseas cases as in Canadian ones, because the percentage of minimal cases discovered overseas in 1943 and 1944 was only 35 as compared to a minimal rate of 56 in Canada during the same period.

The sudden flood of overseas cases which came in 1941 when the Canadian rate was still negligible and the consistently higher overseas rates require explanation. Several factors suggest themselves:

1. *Length of service.*—The time elapsing between the enlistment films and discovery of the disease was 30.8 months in overseas cases and 16.8 months in Canadian cases. This alone would increase the overseas rate; but its effect is partly cancelled by the fact that Canadian cases were found earlier. (In the last 3 years 52% of the Canadian cases were minimal as against 33% of the overseas cases.)

2. *Various conditions* peculiar to overseas service have been blamed for the higher rate, *e.g.*, more arduous training, less nourishing food, tuberculous milk, inclement weather, rougher billets, etc. It is doubtful whether any of these play a part; their effect, if any, could be offset by the fact that the Overseas Army is, in general, selected from the most vigorous and healthy recruits.

3. *More tuberculosis contact.*—The most plausible explanation for the disproportion is increased tuberculosis contact in overseas troops. The circumstances that make this likely are: (*a*) The death rates from tuberculosis in all of the countries to which Canadian troops have been sent is higher than in Canada and their rates in general went up in the first two years of the war. (*b*) Early in the war many sanatoria were evacuated, thus setting up a large number of foci of infection throughout Europe. (*c*) Canadian troops on the loose in foreign countries are more likely to become exposed to sources of infection than similar troops in Canada.

If the higher rates overseas are due to exogenous infection, one would expect that troops from the less tuberculous parts of Canada would be more affected than those from parts that are more highly tubercularized. That this is true is shown in Table II.

TABLE II.

PULMONARY TUBERCULOSIS—PROVINCIAL DISTRIBUTION 1942-44

Province	*Civil death rate*	*Army cases* — *Canada* *No.*	*Canada* *Rate*	*Overseas* *No.*	*Overseas* *Rate*
Saskatchewan	18	5	10	16	37
Alberta.....	22	5	10	15	33
Ontario.....	26	24	10	50	20
Manitoba....	27	7	12	11	22
British Columbia...	45	13	24	18	37
New Brunswick.....	67	13	37	13	43
Nova Scotia..	73	14	28	15	31
Quebec.....	80	65	53	18	20

In this table the Provinces are arranged in order from the least to the most tuberculous, as indicated by the death rates in the white population (1941). It will be seen that the incidence of fresh cases among troops in Canada runs almost exactly parallel with the Provincial death rates. The yield of tuberculosis in the Army in Canada, therefore, depends largely on pre-enlistment environment. Among troops overseas, this Provincial influence is obliterated by a consistent and remarkable increase in rates among troops originating from the less tuberculous Provinces; the rates among those from the more tuberculous regions are not so affected. This must mean that overseas cases are exogenous in origin. No other circumstances could have had this specific effect on troops from one part of the country. Some degree of segregation of troops from each Province operates in the Army; this would tend to minimize rather than enhance the effect noted.

There seems little doubt, therefore, that the higher overseas rates for pulmonary tuberculosis are due to contamination from outside sources. This will be more strikingly illustrated when pleurisy with effusion is considered.

PLEURISY WITH EFFUSION IN CANADA

The striking fluctuation in the yearly rates immediately arouses the suspicion that we are not dealing entirely with tuberculosis; tuberculous infection would not likely wax and wane in the Army throughout Canada. Examination of the histories and films of all these cases still further strengthened the feeling that many cases discharged as "idiopathic", or tuberculous pleurisy with effusion, were likely secondary to acute respiratory infection or influenza. In order to test this possibility, Fig. 2 was prepared.

In the figure, each case of pleurisy with effusion is spotted in at the date of its onset. The Canadian cases will be seen to have occurred in quite an irregular way with a shower of cases between December, 1940, and April, 1941, and another in the first half of 1943. When these cases are expressed in rates (per 100,000 Army strength at the time of their origin) the fluctuations are seen to be absolute and not relative. Superimposed on this graph, the stars show the crests and troughs of the incidence of acute respiratory infections in the Army. The two major waves of pleurisy are seen to correspond with high rates of acute respiratory infections. One cannot escape the conclusion that much of the pleurisy with effusion discharged from the Army in Canada was not tuberculous but secondary to acute respiratory infections. Many of them are cases of "abortive empyema"; they have been sterilized by the use of sulfa drugs.

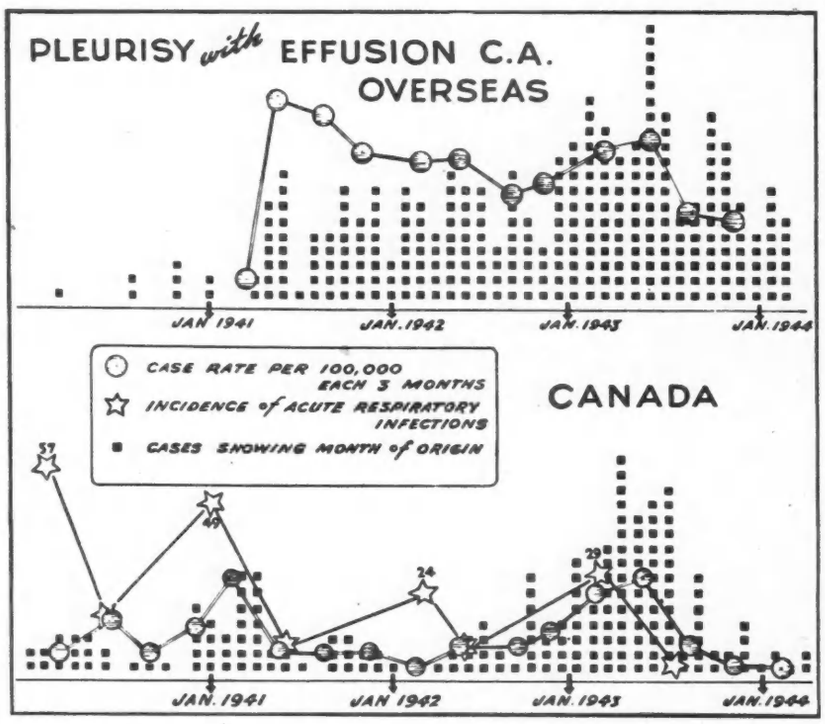

Fig. 2

These findings suggest that during acute respiratory epidemics, pleural effusions should be most carefully examined before being considered tuberculous. This is especially so if there was a prodromal period suggesting influenza or an onset suggesting pneumonia. In all cases early cultures should be made and after the acute fever has subsided a tuberculin test should be done.

PLEURISY WITH EFFUSION IN ENGLAND

Fig. 2 shows the distribution of cases in England to be relatively regular, as one would expect in tuberculous disease. It is possible that part of the total is of non-tuberculous origin. This particularly applies to the bulge in 1943. The relation of this irregularity to acute respiratory infections cannot be demonstrated, since the incidence of the latter is not available at present. That the majority of the cases are tuberculous is suggested by the fact that in 1942 and 1943, 36.8% were proved by culture; one hospital proved 61.1%. Also the clinical histories were, on an average, much more typical than were those of cases arising in Canada.

Since acute idiopathic pleurisy with effusion is largely a manifestation of primary infection one would expect that the brunt of the attack on overseas cases would fall on troops from Western Canada. Table III compares the cases and rates among troops from these two areas in Canada and Overseas. (Cases discharged 1940, 1941 and 1942.)

It is seen that among Western troops, the rate is multiplied threefold on going overseas. Among Eastern troops the rate remains unchanged. This contrast would be even more marked if the cases arising in Canada had not been so diluted by non-tuberculous cases.

As in the case of pulmonary tuberculosis this

TABLE III.

	Western Provinces	*Eastern Provinces*
Civil death rates..	18 to 45	67 to 80
Cases in Canada..	31	30
Rates....	11	27
Cases Overseas ...	69	22
Rates....	32	26

demonstrates that the incidence of tuberculosis in overseas troops is due to outside contamination which selects particularly those who have not been previously infected. A completely analogous situation is seen when nurses and interns are employed in tuberculosis sanatoria. Of the cases of tuberculosis that arise about 90% are in those who have negative tuberculin reactions. Of these about 50% are cases of pleurisy with effusion. It can indeed be said that the incidence rate of pleurisy with effusion in any hospital where tuberculin negative pupil nurses are accepted is a direct indication of the amount of open tuberculosis allowed on the wards.

NON-PULMONARY TUBERCULOSIS

Because the cases are so few, no sound inferences can be drawn. It is, however, obvious that the change of environment upon going overseas has less immediate effect on the incidence of these forms of tuberculosis than it has on that of pulmonary tuberculosis and very much less than on the incidence of pleurisy with effusion. Since in bone and joint disease the clinical disease often appears many years after primary infection, it may be that the incidence of this form of tuberculosis will increase in returned soldiers during the coming years.

Analysis of the figures shows that the increase on going overseas is largely borne by the Western part of Canada. Those recruited in the West have a rate of 3 in Canada and a rate of 7 when overseas; those recruited in the East have a rate of 8 in Canada and 7 when overseas.

SUMMARY

1. The incidence of pulmonary tuberculosis in the Canadian Army is low, not more than a quarter of the rate in civil life. Each year a larger number of cases are discovered. This is partly due to a true increase in incidence and partly due to more effective methods of search.

2. Tuberculous pleurisy in the Army in Canada remains at about civil rates. Arguments are advanced which suggest that a proportion of the cases arising in Canada in 1941 and 1943 are non-tuberculous in origin. In the Army overseas, the proportion that seems to be tuberculous is higher; the rates have gradually gone up and are now three or four times as high as in civil life in Canada.

3. Other forms of tuberculosis are low both in Canada and overseas.

4. The total rates for all forms of tuberculosis are roughly twice as high overseas as they are in the Army in Canada. This is due to greater opportunity for contact with open cases in all the countries to which troops have been sent.

5. The higher rates in Overseas troops are mainly due to infection of troops from the less tuberculous parts of Canada (Ontario and the Western Provinces). These troops are largely tuberculin negative and relatively non-resistant. On coming into contact with a tuberculous environment they show an immediate and large increase in pleurisy with effusion, a more gradual and lesser increase in pulmonary tuberculosis and a still smaller increase in other forms of tuberculosis. These events are the natural epidemiological results of a tuberculin negative group coming into contact with a tuberculous environment.

The authors wish to express their thanks to Major G. A. Ferguson, R.C.A.M.C. for statistical advice.

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Dr. Harlow Shapley of Harvard University, in a recent address to the American Association for the Advancement of Science, made the following statement: "During the first eleven days of the Normandy invasion we lost, in killed, an average of 300 Americans a day. But cancer killed about 400 Americans on each of those days. And cancer does not ease up, it offers no armistice, it tortures before permitting death release, and it will eliminate 150,000 more Americans during the next twelve months. It should be noted that we are now spending less than two dollars in the cancer war for every million dollars in the war against foreign enemies."—*The Medical Times*, November, 1944.

GASTROINTESTINAL SYMPTOMS IN CARDIOVASCULAR DISEASE*

By John W. Scott, M.D., C.M., F.R.C.P.(C)

Edmonton

SOMEONE has sagely remarked that when a young man comes complaining of his heart one should suspect a stomach disorder and conversely when an old man complains of his stomach one should investigate his heart. There is at least a grain of truth in the latter part of this statement that I believe warrants some consideration.

The digestive system ministers to the very primitive human instinct of obtaining food with which to sustain life. It is not to be wondered at, therefore, that disorders of digestive function can give rise to sensations which impinge themselves on consciousness and create discomfort sufficient to bring the individual to the physician. Such symptoms as loss of appetite, flatulence, nausea, vomiting, upper abdominal discomfort and pain we conveniently group together as dyspepsia. These symptoms rightly call attention to gastric disease. Yet a goodly number of sick people with such symptoms are found, on investigation, not to have primary organic disease in the stomach such as ulcer, cancer or gastritis. Some will have faulty nervous adjustment; some faulty physical habits; some a toxic or infective factor; others a disturbed reflex mechanism as causes for their dyspepsia.

Let us consider what part cardiovascular disease plays in the latter group. It is a common experience to find patients with primary disease of the cardiovascular system presenting themselves with digestive symptoms. Such symptoms may obscure the clinical picture and lead to an incorrect diagnosis.

Let us briefly review a few of the conditions in which such confusion may occur.

1. *Congestive heart failure.*—The incidence of digestive symptoms is notoriously common and misleading. The underlying mechanism is, in most cases, the passive congestion resulting from portal stasis. This stasis of blood in the splanchnic area can produce unpleasant sensations based on changes in viscero-sensory reflexes in abdominal organs. Such symptoms as loss of appetite, flatulence, right upper quadrant or epigastric discomfort and pain, nausea and vomiting may stand out in bold relief and indeed form the presenting picture.

Physical examination may reveal evidence of loss of flesh, a distended tympanitic abdomen, with tenderness and increased resistance on palpating the epigastrium or right upper quadrant. The sclera may show a slight icteric tint. The patient may volunteer the information that the flatulence and right upper quadrant pain are made worse by eating a meal. There may be a distinct intolerance of fatty or raw foods. Diarrhœa may be complained of.

Such a story is often reproduced in congestive heart failure from whatever cause. It occurs often enough to warrant the reminder that cardiac disease is to be considered in the differential diagnosis of chronic cholecystitis. Early congestive failure from myocardial fibrosis can so accurately mimic a diseased gall bladder that, in the patient past forty, an assessment of the patient's cardiac state should be carefully made before advising cholecystectomy.

2. *Chronic constrictive pericarditis.*—The differentiation of chronic constrictive pericarditis from portal cirrhosis may on occasion be a problem. In both we may have liver enlargement and ascites with a heart of normal size free from murmurs. Dyspeptic symptoms may occur in both conditions. However, the signs of impaired venous return, as shown by the swollen neck veins, the diminished excursion of the heart on fluoroscopic examination, and the presence of calcification of the pericardium on the x-ray film, point to chronic constrictive pericarditis.

3. *Coronary artery disease.*—(*a*) Angina pectoris. The patient with angina pectoris may present himself with what he terms indigestion. Lower substernal or high epigastric pain sometimes radiating to the interscapular region may be complained of. Flatulence is common, often with relief of pain after belching. The patient may volunteer the information that the pain is worse after a meal, especially when he walks to his office or backs his car out of the garage after a hurried breakfast. There may be present what the patient describes as heartburn. The mechanism of production of dyspeptic symptoms in angina pectoris is not always obvious. We can, I presume, explain the precipitation of an anginal attack after a meal by recognizing that the act of digestion throws an increased load

*Read at the Seventy-fifth Annual Meeting of the Canadian Medical Association, Section of Medicine, Toronto, Ontario, May 25, 1944.

on the circulation. It is stated that the cardiac output may be increased by as much as two litres per minute after a heavy meal. Distension of the stomach produces, reflexly, a constricting effect on the coronary arteries. This may explain the relief of anginal pain sometimes obtained by the belching of gas with or without the use of a carminative.

Can changes of muscle tone in organs other than the stomach produce reflex narrowing of the coronary arteries with resulting anginal pain? There is some clinical evidence that disease of the gall bladder may so act. Chronic inflammatory disease of this organ may co-exist with coronary sclerosis. The removal of the gall bladder in some cases may lessen the frequency and severity of the anginal attacks. One must be wary, however, before advising such a surgical procedure lest the dyspeptic symptoms complained of are due primarily to coronary artery disease.

(*b*) Cardiac infarction. Coronary thrombosis with cardiac infarction occurs in most cases with dramatic suddenness, and the diagnosis can usually be made readily on clinical grounds. The symptoms of onset may however simulate those of acute disease in the upper abdomen, *viz.*, perforated peptic ulcer, acute cholecystitis, gall stone colic, acute pancreatitis or even food poisoning. This picture is a familiar one. The pain of cardiac infarction may be localized in the lower sternum or epigastrium. Nausea and vomiting may be severe enough to focus attention below the diaphragm. In one instance the onset of such symptoms followed the ingestion of what the patient described as "tainted meat" and he was quite convinced he was suffering from food poisoning. Eating a full meal is recognized as a precipitating factor in cardiac infarction. The increased load on a heart with damaged coronary vessels may be enough to upset the balance between the nutritive needs of the heart muscle and the adequacy of the coronary circulation, thus leading to necrosis.

On examining the patient one may find rigidity and tenderness in the upper abdomen. Polymorphonuclear leucocytosis is common. The differentiation is often beset with difficulties and calls for diagnostic team-work between surgeon and physician. One may get some help from previous attacks of angina or a preceding history of clear-cut upper abdominal disease. The upward radiation of the pain in cardiac infarction should be enquired for, but in this regard it may not be amiss to mention that the patient with a ruptured viscus may complain of shoulder pain in the supine position. Examination of the heart may show enlargement, the presence of an abnormal rhythm, congestive failure, or in rare cases a pericardial friction rub. The electrocardiographic changes of myocardial infarction may settle the diagnosis. However, these may not be evident in the first twenty-four hours.

4. *Embolism of mesenteric arteries.*—The patient with subacute bacterial endocarditis, auricular fibrillation, or mitral stenosis may, in the natural course of his disease, throw out emboli from the left heart leading to embolism of the peripheral vessels. If these emboli lodge in the superior or inferior mesenteric arteries or their branches, symptoms and signs of acute intra-abdominal disease may develop. One may get a picture resembling acute appendicitis, acute cholecystitis, gall bladder or renal colic, or even acute intestinal obstruction. If a larger mesenteric artery is occluded, there will be fever, intense abdominal pain, rigidity and shock. The resulting infarction leads to serious visceral changes requiring immediate surgical treatment. Frequently, however, in subacute bacterial endocarditis minute emboli may be set free giving rise to transient attacks of abdominal pain. The toxæmia of the infective process may give lead to anorexia and other dyspeptic symptoms. These with the transient attacks of abdominal pain may cause confusion until the true nature of the disease is established.

5. *Cardiac arrhythmias.*—The patient with extra-systoles or paroxysmal tachycardia may come to the physician with flatulence and a feeling of upper abdominal distress. In some cases the abnormal rhythm may follow shortly after a meal. The diagnosis is readily made however if the patient can be seen during an attack.

6. *Valvular heart disease.*—If the congestive heart failure is present as a result of chronic valvular disease, dyspeptic symptoms as previously mentioned may be present. Mitral stenosis deserves special mention however. When this lesion is of some standing, the enlarged left auricle may extend backward in the mediastinum and exert pressure on the œsophagus. Dysphagia may be complained of. The backward curvature of the gullet can be readily visualized under the fluoroscope during the

swallowing of an opaque meal. Aortic aneurysm may occasionally give similar difficulty in swallowing.

Dyspeptic symptoms arising in treatment.—Since Withering's original description of the effects of digitalis leaf 159 years ago, it is common knowledge that anorexia, nausea and vomiting occur in its use. Nevertheless we are prone to forget this, especially in the patient who has been on digitalis medication for a prolonged period. The cardiac patient varies greatly in his tolerance of this indispensable drug. Preparations of digitalis lanata such as digoxin and cedilanid may be tolerated where those of digitalis purpurea cause digestive disturbance.

The purine diuretics such as theobromine, theophylline and their compounds, often cause gastric irritation when given in full therapeutic doses. This toxic effect may limit their usefulness in the treatment of congestive heart failure. It may be lessened by giving the medication after meals. One drug of the series may be tolerated where another causes dyspepsia.

The organic mercurial diuretics such as salyrgan are usually well tolerated. In a few cases, however, their use may lead to nausea, vomiting, cramp-like abdominal pain and diarrhœa.

Acid-forming salts such as ammonium chloride, ammonium nitrate and calcium chloride are often used orally to potentiate the action of the organic mercurial diuretics. These drugs frequently cause gastric irritation. This can be partly overcome by giving them in gelatin capsules or enteric coated tablets.

SUMMARY

The patient with cardiovascular disease may present himself with digestive symptoms. Such occurrences are common, particularly in congestive heart failure, coronary disease and in some cardiac arrhythmias. The significance of these symptoms in cardiac disease has been outlined. Most of the drugs commonly used in cardiac disease may, in some patients, lead to digestive symptoms.

Tegler Bldg.

A glass beaker which had previously contained "D.D.T." and had been thoroughly washed and rinsed with hot water was used as a container for roaches. The next day, much to everybody's surprise, it was found that all the roaches had died, in spite of the fact that the container was clean and there were no visible traces of the "D.D.T." which had previously been in the container.—*Canad. Hospital,* December, 1944.

INDICATIONS FOR SHOCK THERAPY IN MENTAL ILLNESS*

By Lorne D. Proctor, M.D., D.Psych.

Toronto

IN discussing the indications for shock therapy, it would appear practical to mention briefly the more common types of such treatment, their history and fundamental technique. Shock therapy is a term that has been coined to indicate treatment which brings about a sudden or prolonged state of unconsciousness. It is therefore not difficult to appreciate that many and varied methods are employed to this end. It would be laborious to enter into a detailed discussion of the multitudinous types of shock therapy. These therapies can be divided roughly into two groups, namely those producing convulsions and those directed to produce a state of coma that extends for 15 minutes to an hour. In the last decade there has evolved from observations on many thousands of cases, two methods of shock therapy, which are recognized as the treatment of choice for selected psychiatric cases. These two types are insulin therapy, sometimes termed hypoglycæmic shock therapy, and electroshock therapy. We will limit the discussion in this presentation to such therapies.

The so-called insulin shock therapy for schizophrenia originated with a young Viennese physician, Manfred Sakel. In 1928 he was using insulin to alleviate withdrawal symptoms of morphinism and observed that in moderate doses insulin would pacify and relieve the restlessness. This observation suggested its use as a sedative in other psychotic states. Particularly good results followed in a few cases, who by accident passed into hypoglycæmic coma, and Sakel was encouraged to produce coma deliberately in a number of schizophrenic patients. Five years of experiment followed before he read his first paper on the subject before the Medical Society of Vienna in 1933. The treatment was first used in America in 1936 when Dr. Sakel was invited by Dr. F. W. Parson, then Commissioner of the Department of Mental Hygiene for New York State, to come to New York, and demonstrate his technique before a selected group of psychiatrists at Harlem Valley State Hospital. To my knowledge the first insulin shock therapy in Canada

* Read at the Seventy-fifth Annual Meeting of the Canadian Medical Association, Section of Medicine, Toronto, Ontario, May 24, 1944.

was given in Nova Scotia in 1937 and two months later the insulin unit at the Ontario Hospital, New Toronto, was opened. Psychiatric groups throughout the country continue to employ fundamentally this type of psychiatric therapy.

Electroshock therapy has replaced the other types of convulsant therapy, among which metrazol was most commonly employed. The reason for this replacement was because of the extreme fear and problem of control associated with metrazol therapy. Electroshock has eliminated to a significant degree both these unsatisfactory features of convulsant therapy. Electroshock was devised by Cerletti and Bini in 1938 in Italy and was instituted in the British Isles and America during the subsequent two years. Electroshock was administered for the first time in Toronto in 1941.

TECHNIQUE

Insulin shock therapy consists of the administration of insulin given subcutaneously early each morning to a fasting patient, starting at 20 units and increasing the dose in increments of 20 units daily until the coma dose has been reached. The patients pass through various states of consciousness and may show any or all of the following features: somnolence, restlessness, euphoria, confusion. Drooling, sweating and myoclonic twitching may occur and the patient finally passes into a state of unconsciousness. The criterion for coma in the research unit of the Toronto Psychiatric Hospital is the inability of the patient to be roused by energetic shaking of the shoulders. Coma may progress so that corneal reflexes are lost but it is not allowed to continue after reaching the point of loss of pupillary light reflexes. It is desirable to maintain the coma from 20 minutes to half an hour, and in special cases it is preferable to terminate if possible with the patient in an euphoric or excited phase, should such a phase occur. The patient's treatment is terminated by the administration of 30% glucose solution by mouth, if coma has not occurred, otherwise by gastric gavage, or by a 50% solution of glucose in sterile water given intravenously. A series of 40 to 50 treatments is given and during this series it is hoped that approximately 20 will result in coma. Four to six treatments are given weekly.

The fundamental technique employed for electroshock consists of an apparatus which allows regulation of the amount of power administered over an exact period of time. The standard equipment available on the market utilizes 60-cycle alternating current with a voltage varying between approximately 90 and 200, the current varying between 300 and 1,200 milliampères and duration of application between 0.05 and 1 second. With this type of equipment, the electrodes are placed one on each temple, the skin first being anointed with electro-jell, a saline-soaked gauze covering being applied between the anointed area and the electrode. A second type of electroshock equipment that has recently been developed by Reiter, Friedman and Wilcox,[1] uses in place of the 60-cycle alternating current, a unidirectional fluctuating current which requires much less power to obtain a convulsion, and apparently causes less cerebral dysrhythm as shown by electroencephalography.[2, 3] With the latter equipment, a positive electrode is placed on the left temple and a negative electrode on the vertex of the skull. The clinical results with either apparatus are identical.

The only preparation for electroshock is abstinence from food for three hours prior to treatment and the emptying of the bladder immediately before the treatment. If the patient is extremely apprehensive, oral or intravenous administration of sodium amytal to the point of hypnosis facilitates the procedure. A two-inch Dunlop pillow mattress is placed on the flat surface of either a treatment table or hospital stretcher and the patient reclines with a pillow or sandbag just below the inferior angles of the scapula so as to extend the spinal column in the mid-thoracic region. The patient is restrained at the hip and shoulder girdles and the knees by the nursing staff, a gag is placed well back between the teeth and the angles of the jaw are held firmly. At the time of the convulsion a reasonable amount of movement is allowed at these points of restraint so as to expend a portion of the muscular contraction in movement of the limbs. Immediately on applying the power, the patient goes into the tonic phase of the convulsion and this is followed by clonic movements; apnœa persists until some seconds after the cessation of the convulsion. In every respect it resembles a typical grand mal epileptiform seizure. At the end of the seizure, corneal reflexes are absent, the patient is cyanotic with irregular respira-

tory movements, but within 30 to 90 seconds, the corneal reflexes are usually recovered, the respiratory movements approach the normal and in 5 to 10 minutes the patient recovers consciousness, although often is confused. If a grand mal seizure is obtained, the patient usually has complete retrograde amnesia from several minutes previous to the treatment up until the time of regaining consciousness. Usually within half an hour he is able to dress and be up and about, and if an out-patient, can return home or go to his place of work.

The treatment should be given for not less than three consecutive days of the week, until 6 to 8 grand mal seizures have been obtained. If the patient does not show a significant improvement mentally following the 5th grand mal, it is improbable that he will show improvement following any greater number of seizures and treatment should be terminated.

INDICATIONS

The indications for shock therapy are different in cases of mental illness which can be treated outside of an institution compared with those cases who are psychotic and require constant supervision preferably in a mental hospital. We shall consider first the institutional cases. Insulin, or hypoglycæmic shock therapy has proved most valuable in the treatment of schizophrenia. The benefits to be derived by this treatment vary according to the type, the constitutional features in this mental illness as well as the duration of the psychosis previous to the commencement of shock therapy. The ideal case is that of catatonic schizophrenia of abrupt onset, who, previous to the psychotic episode, had been able to support himself in the community and whose mental illness has not been present for longer than six months. Such a patient should have had routine psychiatric hospital care for at least six weeks to three months to assure that there did not appear to be a reasonable possibility for spontaneous remission. The hebephrenic type of schizophrenia (the most common type) ranks next to the catatonic category from the point of view of a favourable prognosis, and following in line is the schizo-affective or mixed type of schizophrenia. Finally, the paranoid schizophrenic group are candidates, but with the understanding that there would be an extremely guarded prognosis in such cases. The simple schizophrenic in whom the constitutional factor is predominant, that is, a patient who has shown schizoid features from at least early adolescence, having never shown a wholesome personality and with tendencies which finally manifest themselves as a schizophrenic psychosis, should not be candidates for any type of shock therapy. In such cases we are dealing with not a temporary personality dysfunction but apparently a deficiency related to personality development, and it is impossible for me to visualize that shock therapy could bring about an improvement when the inherent capabilities of a wholesome personality are lacking. In considering the schizo-affective psychoses, if the schizophrenic features are predominant, there are indications for insulin shock therapy, and should this fail and the patient subsequently become depressed, then there would be indications for convulsant therapy with a reasonable chance of shortening that patient's psychotic episode.

The indications for insulin shock treatment in mental hospital cases, however, are not limited to the ideal case, but in my opinion would include all schizophrenics except the simple types who have not shown psychotic features for longer than 18 months. In a psychiatric hospital it is necessary to consider the nursing problem of the patients and in the majority of the group of schizophrenics described above, we would expect at least a temporary improvement in the nursing problem following insulin shock therapy.

We have no reason to believe that hypoglycæmic shock therapy is of any practical benefit in other than schizophrenic mental illness. The complexity of insulin shock therapy does not lend itself to treatment of patients outside of psychiatric hospitals and until we have neuropsychiatric units as standard components of general hospitals, such treatment will be limited to institutions or private mental sanitaria.

CONVULSIVE THERAPY

In discussing the indications for convulsant shock, we wish to point out the present confusion as to its clinical application. There is no reasonable doubt as to the ideal type of case, namely that of a depression with a minimum of anxiety. In Toronto at the Toronto Psychiatric Hospital, Toronto Western Hospital, and the Ontario

Hospital, New Toronto, our findings confirm the many claims in the literature that approximately 80% of depressive cases recover completely following electroshock therapy. We have observed the result of electroshock in cases of schizophrenia and psychoneurosis. In the schizophrenic group usually there is an immediate improvement following the treatment, but in the majority of cases this improvement is only transient, lasting several days or a week. It is unusual to obtain a complete recovery, and any who have shown this response have belonged to the schizo-affective or the catatonic schizophrenic group, with a psychosis of less than six months' duration. In the research unit of the Toronto Psychiatric Hospital, therefore, we have limited this convulsant therapy as an experimental procedure to these types of schizophrenia, and fully appreciate that it is not as efficacious as insulin shock therapy in the treatment of this type of mental disease. The majority of such cases require hypoglycæmic shock therapy following the unsuccessful use of electroshock. In the out-patient psychiatric unit of the Toronto Western Hospital, we have limited this treatment to the mentally depressed cases and specially selected psychoneurotics. We feel that in an out-patient department, with carefully chosen cases, this treatment is of outstanding value in that it aborts a depression that would otherwise progress to the stage of requiring psychiatric hospital care with the attendant temporary mental embarrassment that is unavoidable on the admission to such a hospital.

In an Ontario Hospital, where the problem is somewhat different from that of an observation hospital such as the Toronto Psychiatric Hospital, or the out-patient neuropsychiatric unit of the Toronto Western Hospital, in that we are dealing with a group of chronically mentally ill patients who present most difficult nursing problems, the improvement after electroshock mentioned above in the schizophrenic, although transient, will be a valuable adjunct in the care of such patients provided that suitable investigation is done to assure that there is no physical contraindication to the treatment. In such cases we are not endeavouring to abort a progressively deteriorating mental process, but merely to reduce the psychiatric nursing problem.

In an observation hospital and an out-patient psychiatric unit one is constantly presented with cases of psychoneurosis which do not respond to psychotherapy or appropriate medication and have no physical contraindications to convulsant therapy. There have been numerous reports in the literature suggesting the value of this treatment in the obsessional compulsive neuroses and we have treated a small group of such cases (6). Each of these cases showed extremely compulsive behaviour and obsessional thinking so that they were inaccessible and thus could not be helped by psychotherapy. There was only one case, who recovered completely and has remained well for three years; this patient's pre-treatment daily routine included the remaking of her bed at least 30 times, the setting and resetting of the table as many times, in addition to the most bizarre ritual at the time of taking food. Her obsessional thinking made it impossible for her to sleep without the help of large doses of barbiturates. The remainder of the group showed improvements varying from several days to several weeks, but returned to their previous unfortunate mental state.

In hysterias, where suggestion is all important, we have had excellent results in cases which were prepared by adequate psychotherapy and who understood that the treatment was merely a minor aid in the re-establishment of their normal mental health. Electroshock should be given in the last phase of such patient's treatment, should not consist of grand mal convulsions, but an extremely light petit mal so that the patient finds the treatment uncomfortable but yet not extremely painful. It must be understood by the patient that it is not given as a punishment in any sense of the word but as a constructive aid to be discontinued when the hysterical features have disappeared. Here, it is very important that treatment only be employed in those cases where an impasse has been reached with the other standard psychotherapeutic measures, *e.g.*, psychotherapy, amytal hypnosis, etc.

An outstanding example of such cases occurred recently. A young girl in her 'teens who had an hysterical paralysis of her larynx and both lower limbs was improved by psychotherapy alone to the point of being able to walk but she could only talk in a whisper. It appeared that we had reached an impasse. It was fully explained to this young lady that she would have treatment which was slightly un-

comfortable and she was impressed that it would result in the return of her normal speech. At the time of treatment the patient was asked to count from one to ten, and in a matter of five minutes, during which three extremely mild petit mals were given, her speech returned to normal and she has maintained this complete recovery for some months.

I mentioned the above cases to demonstrate that apparently there are selected cases of psychoneurosis which can be treated constructively by electroshock, but it is important that we appreciate it is only such selected cases which can be helped by this method. The majority of psychoneurotics are not helped, in fact often they are made worse by such treatment. Electroshock convulsant therapy is only specific for depressive mental states who show little anxiety and who do not respond in a reasonable time to psychotherapy and the other conservative psychiatric procedures.

CONTRAINDICATIONS

The chief contraindication to insulin and electroshock therapy is a previously damaged cardiovascular system or an active infection. To assess the presence of these contraindications it has been our practice to have a competent cardiologist's opinion on candidates for such therapy. A thorough medical examination for foci of infection throughout the body is supplemented with x-ray examinations of the chest where indicated. The slightest suspicion of active pulmonary tuberculosis is an absolute contraindication to either type of shock therapy, as such treatment invariably produces a marked increase in the activity of such an infection. It is of course obvious that in addition to the above contraindications to treatment, bony abnormalities such as tuberculous breakdown, secondary carcinoma, etc. should be investigated radiologically and the presence of such abnormalities would prohibit treatment. Scoliosis or lordosis that is not due to an active process does not contraindicate convulsive therapy.

COMPLICATIONS

The common complication of hypoglycæmic shock therapy is secondary hypoglycæmic reactions which may proceed as far as coma but which seldom occur in a unit staffed by an efficient nursing and medical personnel. Such a complication can usually be avoided by the administration of glucose at appropriate intervals throughout the post-treatment period of each treatment day. Occasionally there is a cardiovascular abnormality such as a tachycardia, arrhythmia or even cardiovascular collapse, but if reasonable observation is maintained, it would be rare to have a cardiovascular collapse before adequate warning had been given by the change in the patient's pulse. Occasionally convulsions occur and in this therapy are considered complications. Usually there are prodomal signs such as twitchings, and the necessary precautions can be taken so that the patient does not bite his tongue should the convulsion occur. If the treatment has not been terminated previous to this convulsion this is done immediately following the cessation of convulsive movements. Finally, the most serious complication occurring in approximately 1% of cases, is prolonged coma. This condition usually presents itself following the termination of hypoglycæmic treatment, the patient does not respond to the standard glucose administration, in fact recedes deeper into an unconscious state, it being impossible to bring about an early change in the patient's coma regardless of measures invoked. Such comas may last for several days. At the beginning of this complication there is usually vasomotor collapse which is extremely difficult to combat; in one of our cases pulmonary œdema was present but fortunately after several days in coma the patient recovered. A complete description of such a complication is given in an article published in the *American Journal of Psychiatry* in September, 1942.[4] Here again, as one gains experience in hypoglycæmic shock therapy, there are indications which we appreciate as warning that prolonged coma is likely to occur and in such cases the duration of the patient's coma is shortened. With such safeguards this complication appears to be extremely rare.

The most common complication of convulsive therapy through any technique is compression fracture of the bodies of the mid-thoracic vertebræ. However, in the Toronto group there has been less than 1% of such fractures and in every case this has been only of radiological significance, no clinical signs being associated with the change in the radiological picture. In our opinion there does not appear to be any indication for the use of curare as a depressant of the convulsant movements in this treatment, as the possibilities of respiratory paralysis following its use, added to the already embarrassed

respirations due to the post-electroshock convulsive state, has resulted in a significant number of fatalities on the American continent. We have observed no clinical fractures to date without the use of curare in our cases. Following electroshock the disconcerting abnormality of respiratory paralysis is occasionally present. This can be treated by artificial respiration and stimulants such as metrazol in sub-convulsive doses, coramine, etc. There may occur a vasomotor collapse and this is treated in the routine fashion. Because of the application of this therapy to affective disorders that are coincident with the involutional period, the possibility of cerebral hæmorrhage following electrical stimulation of the frontal lobes by this technique is real. In Toronto we have had one complication in a male aged 65 which we feel might be attributed to electroshock, although it did not appear until 36 hours following the last grand mal seizure. In this case there appeared a hemiplegia that did improve slightly, but now, ten months following this complication, it is felt there will be an appreciable residual hemiplegia for an indefinite period. It is probable that the neurological abnormalities in this case are attributable to a cerebral vascular accident related in part to his electroshock treatment. The patient recovered his normal mental state so that he is now a much more acceptable problem of a hemiplegia rather than an agitated depression. During the first two years of this treatment in North America, death has occurred in approximately one case per 2,000 treated, or 0.05%, and in the majority of fatal cases the outstanding abnormality prior to treatment was a damaged cardiovascular system. No deaths have occurred to date in Toronto in 400 cases.

RESULTS

In the ideal case, insulin shock therapy has approximately a 50% chance of bringing about a complete remission and in the remaining cases the degree of probable remission varies from 50 to 20%. According to Homer Folks' survey of 2,004 cases,[5] the average stay in hospital of a schizophrenic patient whose duration of illness is less than 18 months, is approximately 7 months, without insulin shock therapy, whereas with insulin shock therapy this is reduced to approximately 3 months. Our findings would agree with this statement. Finally, those patients who do not show a full or social remission, permitting discharge or parole from hospital, have at least a transient improvement in the majority of cases so that for a short time they are much less of a nursing problem. This is a definite advantage particularly at this time when the burdens of the medical and nursing staffs are nearly unbearable.

During the past three years approximately 400 cases have been treated by electroshock in Toronto, and we agree with the generally accepted opinion of the results of the treatment, namely that in cases of depression, if the duration of the illness is less than 6 months, the recovery rate approximates 80%, and this rate decreases as the duration of the illness increases and after 18 months is below 50%. In the research unit of the Toronto Psychiatric Hospital, a series consisting of approximately 65 cases of schizophrenia has been treated by electroshock and there have only been 7 complete remissions (1 catatonic, 4 affectives, 2 paranoids) and in each case the duration of illness was less than 6 months. In a series of psychoneurotics numbering approximately 20, treated at the Toronto Psychiatric Hospital and the Toronto Western Hospital, there were only 5 complete recoveries and here again the duration of the mental illness was less than 6 months.

The confusing point in reports on the efficacy of convulsive therapy is that such results are often based on observations of less than six months following treatment. It is unusual in even the schizophrenic not to have at least a temporary improvement in the mental state following a course of electroshock, but it is short-lived and may range from a matter of hours to several days or weeks. In the data that has been presented, a complete recovery infers that the patient has remained well for at least 6 months following the termination of shock therapy.

In closing, it is important that these therapies be considered only as adjuncts to the well-established conservative psychiatric techniques with psychotherapy as the fundamental implement in helping our mentally ill. Shock therapy is a means of temporarily improving the patient's mental state so that he is accessible, and by means of psychotherapy can be carried on to a wholesome mental state. It is therefore not a cure and, in my opinion, is of very limited therapeutic value alone. It should be reserved for very definite types of mental illness, in the first place disorders of

less than 18 months' duration who have not recovered under more conservative psychiatric procedures which have been attempted over a period of not less than 3 months. In the case of schizophrenia, insulin shock therapy is the therapy of choice and convulsant shock should only be considered if the patient shows catatonia so that he presents an acute nursing problem and is completely inaccessible for psychotherapy. In such cases, the patient should be in excellent physical health and a recovery should only be expected in the exceptional case whose psychotic episode has been of less than 6 months' duration. Electroshock therapy is indicated occasionally in the psychoneurotic group in cases of the obsessional compulsive type of behaviour and the hysterias that have not responded to at least three months of energetic psychotherapy, and where the patient is in excellent physical health, fully appreciating that recovery is unusual. Electroshock therapy is only specific therapy for depressed mental states. Shock therapy is dangerous therapy and must be supplemented by the well recognized conservative psychiatric therapeutic procedures.

The electroshock therapy administered at the Toronto Psychiatric Hospital has been under the supervision of Dr. C. B. Farrar and in the Toronto Western Hospital under the supervision of Dr. H. K. Detweiler. Reference has been made to cases subjected to electroshock by Dr. N. L. Easton under the supervision of Dr. T. D. Cumberland, Superintendent of the Ontario Hospital, New Toronto and to material in a publication by Dr. N. L. Easton and H. O. McNeilly, Reg.N.[6]

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Medical Arts Bldg.

We are always complaining that our days are few, and acting as though there would be no end of them.—Seneca.

THE PHYSICIAN'S RÔLE IN PROTECTING THE WORKER'S HEALTH THROUGH CONTROL OF THE INDUSTRIAL ENVIRONMENT

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THE physician new to industry soon finds there is more required of an industrial medical service than simply the treatment of accidents. Industry is health conscious and expects the plant physician to be active in promoting better health. For this reason the industrial physician must be in a position to answer and act on all questions relating to the worker's health and comfort. Of particular importance is the recognition of those environmental conditions in the plant which affect the health and happiness of the worker.

Environmental conditions that may influence health or comfort fall into two groups. In one group are factors common to all industries, such as ventilation, heating, lighting, sanitation, seating, etc. In the other group are those conditions that favour the development of industrial diseases and which are encountered only where toxic materials are handled.

Sanitation still demands attention. Although it is difficult to demonstrate the relationship between health and cleanliness, without doubt a clean plant results in better working conditions. The physician should take an interest in all plans for better housekeeping in the factory. Attention to sanitary facilities is particularly important, as such equipment is usually the first to be neglected when general housekeeping fails. The plant physician should be familiar with the Factory and Health Acts of that Province in which the plant is located. The requirements of such Acts are based on experience, and in most instances are practical standards to follow. The plant drinking water should be investigated.

Ventilation problems are always encountered. Like the weather, ventilation is a common topic for complaint. Few people have even an elementary knowledge of this subject. The

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plant physician should at least appreciate that general ventilation is primarily concerned with providing air conditions, free from objectionable odours, which permit the body to lose its excess heat without undue strain. He should also be aware of the fact that under ordinary conditions the process of breathing does not vitiate or poison the air. In ordinary buildings, even when the ventilation is considered to be bad, very little change in oxygen or carbon dioxide content of the air is noted. The fact that ventilation is largely concerned with heat loss from the body closely connects it with heating. In cases of dispute as to whether the plant is too hot or too cold, the plant physician will undoubtedly be consulted. It is well to remember that in cold weather there is no valid reason for keeping windows open, to the general discomfort of most of the workers. Neither should the factory temperature be maintained at high levels to suit individuals accustomed to tropical conditions. Good ventilation and heating is that which provides comfortable conditions for the majority of the workers. A few who desire colder or hotter conditions should satisfy their idiosyncrasy to heat and cold by varying the type and quantity of their clothing.

In general, the air should be cool rather than hot; dry rather than moist; and some air motion is desirable for its stimulating effect. In the winter time, workers located near outside walls may lose considerable heat to the cold wall by radiation. For this reason it is not good practice to have desks or work benches so arranged that workers sit within a few inches of an outside wall.

Lighting is a common problem. The foot-candle is the accepted standard of illumination and inexpensive foot-candles are available. For ordinary work ten foot-candles are quite satisfactory. For fine work more illumination is necessary. Extremely fine work requires special spectacles as well as good illumination. There is some evidence to indicate that people with certain types of eye conditions are benefited by increased illumination. Glare may be caused by a source of light that is too strong, such as the sun, by the reflection of light from bright surfaces, or by contrast between light and darkness. Much discomfort is produced when a person alternately looks at objects with marked differences of illumination. This should be avoided as much as possible. The benefits of good factory lighting are: reduction in accidents, better workmanship, increased production, decreased eye strain, happier workers, and cleaner work places. Light shows up dirt, and seeing it stimulates good housekeeping. When artificial lighting is used it is better to have the candle power somewhat higher than the recommended standard in order to make certain that the proper illumination will be maintained during the life of the equipment. Poor housekeeping and dirty lights greatly reduce the effective light, even when the lighting equipment has been properly designed.

While most Factory Acts require that seating be available for female employees in order that they may take advantage of any spare time for resting, no such provisions have been made for men. Most industries, however, provide seats for both sexes whenever the type of work permits the operator to be in a sitting position. This is good business, as working in a restful position prevents waste of energy and thereby increases output. The seats provided in industry are not always suitable for the type of work to be done. It is not uncommon for workers to state that they prefer to stand rather than use the seats supplied. To be satisfactory an industrial seat should be adjustable to the height of the machine; it should be saddle-shaped, and about 16 inches wide. The depth of the seat should be such that comfort is obtained, while at the same time the blood vessels behind the knees must not be constricted. The back of the seat should support the lumbar region of the body, and be adjustable to fit the individual. Where possible, the seat should be made in such a manner that it can be moved out of the way to permit alternate sitting and standing. Foot rests should be provided. In checking industrial seating it is well to note whether the seats have back supports, whether they are too high or too low, and whether they are properly shaped. If the seats are satisfactory but the worker still complains of discomfort, perhaps the bench or table used is too low, no foot rests have been provided, or the seats have been crowded together in such a manner as to interfere with elbow room.

The control of noise is an engineering problem, but its possible effect on health and efficiency places some responsibility on the industrial physician. Until recent times very little progress was made in the control of industrial noise. Noise is inevitably present wherever machinery is operated. Its suppression and

control are frequently costly and difficult to attain. In the future the plant doctor will be more frequently consulted by management regarding the effect of noise on health. Noise may be defined as any unpleasant, loud, distracting sound. The performance of the worker is reduced. Concentration, especially in mental work, is more difficult. Emotional disturbances may result. More definite, however, is its effect on hearing, with possible resulting deafness. Unnecessary noises, such as the excessive blowing of an automobile horn, are more apt to cause annoyance than a noise produced by some useful operation. To the trained ear of the skilled mechanic a noise indicating that his machine is not operating satisfactorily is particularly upsetting. To the untrained person no such emotional reaction would be experienced. The effect of noise on health and comfort is not entirely understood. More investigational work is indicated on this interesting subject.

Music is comparatively new to industry, but the practice of introducing it in plants is increasing. Several large Canadian establishments which are providing music for their workers report increased production and efficiency, reduction of error, decrease in absenteeism, less mental fatigue, and improvement in morale. To the physician any measure that promotes contentment of the worker is desirable. The type of music and the length of time it is supplied must be worked out by experience for the group in question. In general the music should be familiar to the workers. Extremes of tempo should be avoided. Best effects are produced when music is provided for workers employed on monotonous work of a repetitive nature.

In order to determine the presence of toxic material in a plant, the physician must have an intimate knowledge of the materials used, the nature of the products and by-products manufactured, and the methods of processing. The plant chemist can be of great assistance to the industrial physician regarding materials likely to be encountered. When it is known that toxic materials are used, the plant doctor should satisfy himself and management as to whether a real health hazard exists. To do this an understanding of how industrial diseases are caused, and the methods used for their control, is required.

Most industrial diseases are caused by dusts, gases, vapours, or fumes, that have poisonous properties. In many cases the materials causing damage to the worker's health are not ordinarily considered poisonous, and only cause trouble because of the conditions under which they are being used, or because of the method by which they gain access to the body. For instance, sand, which is not usually considered a dangerous material, can under certain conditions cause irreparable damage to the lungs.

Since the beginning of time, dusts have been encountered everywhere, but it has been only since the development of specialized industry that they have become important from a health viewpoint. Industrial dusts can be divided into three groups: so-called harmless dusts, dusts composed of definitely poisonous materials, and dusts which cause scarring of the lungs.

So-called harmless dusts are dusts containing no appreciable amount of free silica or poisonous material. Limestone is a good example of a so-called harmless dust. Such dusts, however, are not without some harmful action. Heavy concentrations of so-called harmless dust, when breathed, mechanically irritate the nose and throat, producing inflammation of the lining membranes of these and adjacent organs. The concentration of dust necessary to produce this effect is heavy, and at the time of breathing causes discomfort to the worker. In this type of exposure a worker will usually wear a respirator for comfort as well as for protection.

Poisonous dusts are often produced in industry when toxic materials are being processed. Probably the most common, and one of the most poisonous materials used in industry is lead. Lead and lead compounds can enter the body by absorption through the skin, by ingestion, and by inhalation of lead-containing dust. Absorption of lead through the skin is likely to occur only when such compounds as tetraethyl lead are handled. Fortunately these compounds are seldom used in industry. Ingestion of lead by mouth usually results from unclean habits of workers. When lead is ingested its absorption into the body depends upon the solubility of the lead compound in the intestinal fluids. This form of lead poisoning is not common in industry.

Inhalation of lead-containing dust is responsible for nearly all the cases of lead poisoning that occur in industry. Irrespective of its chemical form, the lead dust breathed into the lungs is absorbed by the blood stream and enters the general circulation. The chemical

composition of the lead compounds in the dust is in general therefore not of much importance. The important consideration is the actual amount of lead in the air being breathed. Two or three milligrams of lead dust breathed daily over a period of time will usually create changes in the body. In lead exposures the worker does not as a rule see the dust, nor is he necessarily conscious that he is breathing it. There is no special irritation of the nose, throat or bronchi. The lead entering the blood stream circulates through the body, damaging many organs. It is partly excreted in the urine or fæces and partly stored in the bones. The fact that lead is stored in the body makes it a cumulative poison. For this reason it is possible to have acute cases of poisoning among workers who are exposed to very small amounts of lead over a period of time. It also accounts for cases of lead poisoning occurring in workers who have not been exposed to lead for some time.

Arsenic-containing dusts are occasionally met with in industry. While arsenic has a widespread reputation as a poisonous material, its use in industry is attended with less trouble than accompanies the use of lead. It has, however, in addition to its general poisonous properties, a tendency to cause skin irritation, pigmentation and keratosis, and to erode the septum of the nose.

Cadmium is another toxic material which is being used increasingly in industry. Operations that involve the handling of cadmium or its salts require special attention. Cadmium fumes are very injurious to the lungs, and even minute quantities when breathed can cause pulmonary œdema. This latter condition usually occurs several hours after exposure. The heating of cadmium or cadmium-plated articles to a point where fumes are produced is very dangerous, unless special precautions are taken.

Dusts which produce scarring of the lungs are receiving considerable attention today. These dusts are composed partly or wholly of free silica (silicon dioxide). The disease produced is called silicosis. It is a serious disease, the fatal termination from which is usually due to tuberculosis. Quartz and flint are practically pure silica. Granite is about one-third silica, and many other rocks and sands contain it in varying amounts. Exposures to silica dusts occur in industry at such jobs as mining, quarrying, stone-cutting, moulding, grinding, and sand-blasting. With the exception of sand-blasting, where the dust concentration may be very high, silicosis is produced only after many years of exposure. Not all those persons exposed to silica dust develop the disease during the ordinary span of life.

In gold-mining the gold is usually found in a quartz vein, and in coal-mining the silica may be present in the rock about the coal seam. Moulders are exposed to silica from the sand and parting materials used. During the last few years non-silica parting materials have been developed and have largely displaced the silica type in industry. The sand-blaster receives his silica exposure from the fine sand produced during abrasive cleaning. Grinders get their exposure from the sand adherent to the casting being ground, or from the use of natural grindstones. Fortunately, however, most of the grindstones used in industry are made of artificial materials that do not contain silica.

Silica dust in the air must be of a certain smallness before it can enter the lungs. Particles of dust big enough to be seen with the naked eye are not important. The particles of silica that can cause silicosis are less than ten microns in size. These small particles do not readily settle out of the air but stay suspended for a long time. It is a good rule to remember that where visible dust is present there is probably much fine dust also. Sometimes when no visible dust is present the amount of fine dust may be great, but this situation is rather unusual.

Poisonous vapours and gases can for convenience be divided into four classes, according to the way in which they made their presence known. These classes are: vapours and gases that cannot be smelt or seen, and are not irritating, those that can be seen, those that make their presence felt by irritating action, and those that make their presence known through sense of smell.

In the first group are carbon monoxide, hydrocyanic acid, mercury vapour, and many other materials. There is little trouble from carbon monoxide in industry, although the potential exposure is great. This is due to the common knowledge regarding the toxicity of this gas, and to the adequate precautions taken to control exposures.

Hydrocyanic acid gas has been the cause of many deaths when used for fumigation. It is evolved when cyanide salts are mixed with

acids. In industry cyanides are used largely in the process of electro-plating, hardening of metals and for the extraction of gold. If care is taken to prevent cyanides coming in contact with acids little trouble will be experienced. Cyanides are sometimes the cause of skin irritation.

Mercury vapour is given off from metallic mercury. As little as one milligram breathed daily over a period of time can cause poisoning. The use of this metal is restricted to a few industries.

In the second group the most important vapours that attract our attention by their visibility are nitrous fumes. Nitrous fumes are brownish to black in colour. They are evolved wherever nitric acid is used. Materials like celluloid or guncotton when slowly burned or oxidized give off these fumes. Oxides of nitrogen although slightly irritating can be breathed in fatal concentrations without much discomfort. Of all poisonous fumes these are the most insidious, as pulmonary œdema may occur suddenly several hours after exposure. The result is often fatal and the true cause of death is not always recognized.

In the third group are gases that are extremely irritating, such as ammonia, sulphur dioxide, and chlorine. While these gases are toxic in small concentrations, their irritating effect is so great that no one would voluntarily enter or remain in a room which contained immediately dangerous concentrations. When death occurs from these gases the cause is usually an accident, a pipe or a container breaking in a confined space and producing a lethal concentration in the air before the occupants can escape.

In group four are many vapours and gases that can be recognized by smell. All solvents, diluents, and lacquers, cleaning fluids used by dry cleaners, paints, rubber cements, and many other products contain volatile substances which can often be recognized by the sense of smell. The number of chemicals in this group is increasing every day. In lacquers there is usually a mixture of volatile substances making exact recognition by smell difficult. Many of the materials in this group have an anæsthetic action when inhaled in high concentrations. It is obvious that a concentration high enough to produce this effect is encountered in industry only as an accident. It is the small amounts inhaled, without apparent trouble, day after day, which may constitute a serious industrial hazard. In this group are benzol, trichlorethylene, carbon tetrachloride, gasoline, hydrogen sulphide, arsine and many others.

Benzol or benzene must not be confused with benzine, the petroleum product. Benzol is produced as a by-product in the destructive distillation of coal and to a limited extent from petroleum. It is often a constituent of rubber cements, of leather dopes and cements, and of paint removers. It may be present in lacquers, thinners, and many other preparations. Benzol poisoning in industry usually occurs from the breathing of small amounts of benzol day after day for a long period of time. Benzol acts on the blood-forming organs. The disease is very insidious, the workman seldom complaining before he is fatally poisoned. If the exposure is not recognized the real cause of death (aplastic anæmia) is sometimes missed, since the terminal illness may appear as a respiratory infection. It is the continuous exposure to small amounts of benzol that causes trouble rather than the occasional heavy exposure.

The use of trichlorethylene and of carbon tetrachloride in industry is increasing. These materials are used in dry cleaning plants. Trichlorethylene as a de-greasing agent for metal is finding a real place in industry. Carbon tetrachloride is sometimes used in rubber cements and fire extinguishers. These substances are non-inflammable, and under certain conditions, break down into phosgene, a very poisonous gas. The vapours of both are much heavier than air. Carbon tetrachloride in moderate amounts causes nausea and vomiting and probably some liver damage. Both these substances are very volatile and quite expensive, and means for the recovery of the vapours are used for economic reasons. Experience and research suggest that carbon tetrachloride is more toxic than trichlorethylene. Nausea and vomiting amongst workers in contact with solvents or cleaning solutions suggests the presence of carbon tetrachloride.

Gasoline and similar petroleum compounds, although largely used, do not create a serious health hazard in industry. In high concentrations gasoline vapour causes unconsciousness and death, but exposure to high concentrations occurs only accidentally. Gasoline containing tetraethyl lead should never be used in industry. although its use for the automobile has not been attended by any special trouble.

Hydrogen sulphide in low concentration has the odour of "rotten eggs" and in high concentrations has an irritating effect. It is frequently present in the chemical laboratory. Dangerous concentrations of this gas may occur in tannery vats, fat-rendering plants, chemical plants, glue factories, and sewers. Its toxicity is about the same as that of hydrocyanic acid gas, but its smell and irritation give some warning. Sore eyes are common among persons exposed to low concentrations of hydrogen sulphide. High concentrations may result in cessation of breathing due to paralysis of the respiratory centre or in a delayed pulmonary œdema.

Arsine is a gas having an unpleasant garlic-like smell. It is very poisonous. The gas itself is not used in industry but may be produced as an unwanted by-product. When acid is applied to metals arsine can be evolved in dangerous amounts if the acid or metal contain even traces of arsenic. Arsine is also produced by the action of water and dilute acids on metallic arsenides, and by many other chemical reactions. Two forms of poisoning occur, acute and chronic. In both types blood destruction takes place. In the acute variety the destruction of red blood cells is very rapid. In such cases the mortality is high. In the chronic variety the destruction of the blood cells is very gradual and affected workers as a rule do not complain until the hæmoglobin has been reduced to 40 or 50%. In chronic cases recovery is the rule if the individual is removed from exposure in time.

Industrial diseases are usually caused by the breathing of dangerous dusts, fumes, or gases. The responsibility for their prevention or control belongs to the employer rather than to the employee. Very often a non-poisonous material can be substituted for a poisonous one without affecting the product. At the present time few lacquers or enamels used in spray painting contain either benzol or an appreciable amount of lead. Non-silica parting has largely displaced the silica parting formerly used by the moulder. There are many industries however, which must use poisonous materials, and it is unfortunate, but nevertheless true, that some of the most useful materials have harmful potentialities.

If the materials used are toxic in nature, the prevention of industrial diseases can be accomplished only by a definite program of control. The program varies with circumstances. In general, it involves methods of handling materials, ventilation, segregation of dangerous processes, the use of personal protective equipment, cleanliness, and medical control measures.

Handling dangerous materials should be conducted in such a manner as to produce a minimum production or dissemination of dust, fumes, gas or vapour. In practice this is accomplished by the use of enclosed systems of processing, of wet methods instead of dry, and of low temperatures instead of high, and by changes in methods such as brush painting instead of spraying, and vacuum cleaning instead of dry sweeping. If enclosed systems are used under increased pressure the danger is always greater than if a reduced or atmospheric pressure is maintained in the enclosure.

Ventilation plays an important part when poisonous materials are used. If possible local exhaust equipment should be used at all points where toxic substances may escape into the workroom. Examples of local exhaust equipment to control specific hazards are the spray booth, hoods, exhausted chrome plating tanks, and grinding wheels. When local exhaust is not possible, general ventilation is required. This usually means that a much larger volume of air must be handled to control the hazard, with subsequent increased cost of heating in cold weather. It is commonly used when bulky objects are sprayed.

Processes using dangerous materials should always be segregated so that a minimum number of workers is exposed. Personal protective equipment such as respirators, special clothing, gloves, goggles, and protective creams may be required. Care should be taken to obtain the right equipment for the hazard in question. The plant physician should be familiar with the various types of respiratory and other protective equipment used in industry.

Cleanliness, both plant and personal, should be practised. Workers should wash carefully at the end of each work shift. Under certain conditions daily showers at the end of the work day are necessary. A regular program to provide clean work clothes is essential when toxic materials that can be absorbed through the skin are handled. A double locker system, one for street clothes and one for work clothes, is often desirable. Medical control methods start at the time of employment and continue as long as the worker is exposed to toxic ma-

terials, and preferably for a period after his removal from contact.

The pre-employment examination is used primarily to select workers who are physically capable of doing the required work. When toxic materials are present, the pre-employment examination must weed out "susceptible" individuals. Workers who are already suffering from chronic illness, or those who present either blood pressure changes or abnormal blood pictures, are not acceptable. Workers employed to handle toxic materials should be in good health. Defects such as hernia are not necessarily important, and in some jobs age may not be a handicap.

During employment, definite control methods are necessary for the worker exposed to toxic materials. These include education, inspection, periodical examination, dispensary service, and record keeping. The worker should be instructed as to what he should do to avoid poisoning. Too much information regarding symptoms is undesirable as it leads to self-diagnosis. The worker should understand that he can report to the medical department at any time when he considers his health is being affected. It is important that when he does report he is treated with consideration, even though his visit is unnecessary. Frequently the industrial physician or nurse discourages workers from reporting minor troubles. Often the plant doctor or nurse is not familiar with the materials and processes used in the factory.

The plant physician and the industrial nurse should make regular inspections of the factory. During such trips they should talk to the workers and show interest in their well-being. An inspection trip of this nature is a walking clinic in which a closer relationship is obtained between the workers and the medical department. The general appearance of the workers can be noted; also it can be observed whether personal cleanliness is practised and whether the company is doing its part to keep the working environment in a satisfactory condition. Changes in plant methods and in materials should be discussed with officials in charge of production. If interest is exhibited during such visits, production management will soon consult the medical department when changes in materials or methods are contemplated. Particular attention should be paid to the facilities provided for personal cleanliness.

The type of periodic examination varies to a certain extent with each toxic substance used. This variation is not as great as one would expect. If control methods are to be effective they must detect impending trouble before serious illness or disability occurs. Very often specific signs are too late. In general the periodic examinations should be kept simple and short. Frequent examinations are more valuable than detailed examinations at long intervals. Changes noted from time to time in the individual or in the group under consideration indicate the trend of health. No single individual or group examination can supply this information. The examination should include a general enquiry into health, weight, pulse rate, temperature, blood pressure, and hæmoglobin. Much of this initial examination can be done by a nurse under a physician's supervision. This is important, as it may be necessary to check many workers at short intervals. Workers showing abnormal findings are singled out for further investigation. The frequency of examination will depend on the type and degree of exposure. In extreme instances it may be necessary every day. As a rule it is done at much longer intervals, two weeks, a month, or a year. Specific tests are sometimes of value. Stippled red cell counts can be used with great success to control poisoning from lead and to evaluate the degree of exposure. The counts from a group of exposed workers give more information regarding working environment than the examination of the air for lead. The blood picture including the white blood count in benzol exposures is important. Changes in the white count occur long before the worker realizes he is ill. Marked reduction in hæmoglobin is a constant and early finding in arsine poisoning. Silica exposures produce a specific type of lung fibrosis. It occurs somewhat late. Carbon monoxide forms a specific compound with hæmoglobin.

Facilities for the care of minor illness as well as accidents should be provided in plants where toxic materials are used. The workers should be encouraged to report any illness, whether it is considered occupational or not. It is important for the medical department to have the complete confidence of the worker. This can usually be obtained by rendering service for minor illness or in some instances by providing total medical care. The medical department should know if any exposed worker is taking

outside treatment. Workers taking "arsenicals" or "sulfa" drugs should not come in contact with toxic materials. Such treatments may be the deciding factor in precipitating a toxic episode. A worker exposed to toxic materials may have a lessened tolerance for other chemicals such as drugs and alcohol. By looking after minor illness self-medication by the worker will be largely prevented. A good dispensary service permits the worker to have easy contact with the medical department, and keeps the medical department informed as to what is happening between periodical examinations.

Records are essential. No medical control scheme can function properly without an analysis of the work done by the medical department. The individual, the group, and the whole plant should be studied from one examination to another. Particular attention should be paid to dispensary visits. These visits should be classified according to the place of work, the type of exposure, and the most important sign, symptom or complaint registered by the workman at the time of his visit. If attention is paid to minor illness and complaints, serious outbreaks of occupational sickness can be prevented.

The industrial physician must realize that he is part of an organization. The co-operation and assistance of the workers and the officers of the company, as well as management, are required if satisfactory results are to be obtained. The health of the worker is the yardstick of any protective measure instituted for the control of occupational illness. The plant doctor's position in the organization should be clear and definite.

Like the adolescent, faced with new problems, who tries to retreat behind the skirts of parental authority, the individual members of a democratic state tend to shrink from the mental activity it imposes, and would like to take flight into a condition of unthinking security. They would like "the State" or some personification of the State to solve their problems for them. It is for this reason that they become Fascists. . . . For it is only democracy which appeals to the adult in the individual; Fascism tempts his infantile desires.

And yet, one day, men will have to grow up. Compared with the long ages of human existence on earth our civilization is in its infancy. Sooner or later we must be ready to leave the dreamland of childhood, where imagination finds unlimited scope, and take our places in a world of limited freedoms. That world, however, can in the long run give us something better than any vision conjured up in childhood.—Major A. M. Meerloo, M.D.: Total War and the Human Mind, Geo. Allen & Unwin, p. 52, 1944.

MEDICAL CARE OF THE INDUSTRIAL WORKER*

By R. B. Robson, M.B.

Windsor

THE physician in industry is a medical director, a medical engineer, or a human engineer. He is responsible to the chief executive, encouraging him and from him, very often, receiving his inspiration and enthusiasm. No progressive medical care of workmen can exist or progress, without the fullest interest of a sympathetic management. The physician will work with the personnel department, the superintendent, and foreman, and all the while be a true friend of the workmen.

Although the plant physician be employed and paid by industry, he is in a distinctly neutral position, upholding the cause of worker to employer, interpreting the desires of management to employee. He represents to the worker the entire medical profession, as well being looked upon as the local representative of the Workmen's Compensation Board, and an authority on health insurance.

It is not my intention to discuss the care of accidental injuries occurring to the worker, except to say that under the guidance of very efficient Workmen's Compensation Boards, the injured employee receives the best treatment available. Minor surgery is rapidly diminishing in its scope, for the surgical care of an injured hand, be it a superficial laceration or a bone, tendon or nerve injury, requires the same meticulous skill on the part of the surgeon as he would use in the performance of a major operation. The hand is a fine machine, which man uses to earn his living, and even a partial disability from poor repair may cripple more extensively a man's earning power than a malunion of a femur or tibia.

The efforts of accident prevention are so noteworthy and effective that the rate of absenteeism, due to accident, is constantly falling, even below the standard of one day loss per man per year from industrial accident.

AIMS OF INDUSTRIAL MEDICINE

Dr. Greenburg, Director of Industrial Hygiene for New York State, outlines the field of the Industrial Physician as follows:

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* Read at the Seventy-fifth Annual Meeting of the Canadian Medical Association, Toronto, May 24, 1944.

"It is our purpose to control plant working conditions, so that an optimum environment may be provided for the worker; an environment in which he can work with safety, and under conditions which are not detrimental to his health. This portion of the problem may, and usually is, given the name of industrial hygiene, and includes such phases as plant sanitation, illumination, ventilation, safety provisions, occupational disease control, etc., etc.

"The second portion of the problem is essentially non-occupational, and consists in the conservation of the health of the worker through general medical supervision and by the prevention of physical defects, their early detection and correction.

"And finally, the third phase consists in the restoration of the worker to health and earning capacity as promptly as possible following accident or disease."

Workers' Environment

The physician is the health officer to his industrial plant. He protects the worker's environment. He has a working knowledge of toxicology, knowing all the various chemicals used and operational processes in his particular industry; their effect on health and the procedure necessary to prevent harmful reactions.

So active is the control of occupational diseases that the present severity rate is five one-thousandths of a day per 1,000 man hours worked.

Ventilation and Lighting

Ventilation and lighting requirements are understood, and whereas most plant engineers and maintenance department heads thoroughly realize the need of these factors in modern manufacture, frequent plant inspection by the physician is of great assistance.

It will be impossible to give concrete examples, in the time allotted, of all the various aspects of applied industrial hygiene, but here is a question proposed to a medical director of one of the large manufacturing corporations by a Vice-President, "What can we do to make the foundry a more attractive place for men to work, the labour turnover is excessive?" The reply was: "Paint the inside of the foundry white". A short time after hearing this unusual solution, I looked more carefully at the general condition of the walls, roof, and windows of a foundry employing 500 workers. They were dirty, dark, and dingy; smoke from the contact of hot iron on oily moulds made visibility difficult, the skylights and windows were covered with twenty years of grit and grime.

Cleaning the windows, painting the ceiling and walls white, the iron work an aluminum shade and the machines grey, was proposed, accepted by management and proceeded with. The physical change was arresting, but the effect on the workmen, quite as interesting. The men slowly took pride in their different operations. The foundry became a show place, a new ventilating system is in the process of being installed, and the foundry superintendent stated that in three months the union had brought in but one grievance, which was handled by the chief steward, as being too trivial to place before the management.

The manager of another industry enquired, "My office workers are tiring too quickly, we are sound-proofing the room, and would like to revamp the lighting arrangements. What foot candle of light is necessary for comptometer workers?" He continued, "We have removed all the shiny nickel ware from the comptometers and dulled the finish, for we found glare quite a problem, now we must increase the amount of evenly distributed light". It was found that 50 to 100 foot candles of light was necessary and this is being installed.

Nutrition

So much has been written on the subject of nutrition, that the fundamentals are well understood. Extensive advertising has been displayed in the press and popular magazines. Nutrition is a subject for discussion on all recent industrial health programs; yet the practical application in making an individual eat, "what is good for him" is not progressing.

Let me illustrate. Men in industry frequently work from 6.30 in the morning to 4.30 in the afternoon. If they live at a distance from their work, it means arising at 5 a.m., getting breakfast, picking up a lunch, packed the night before, and catching a bus or riding with others to work. It is true, there are rest periods at 9 a.m. and 2 p.m. of ten minutes, for a bottle of milk and a cigarette. Have you ever considered the contents of the workman's lunch-box? Packed every day, six days a week for periods of perhaps fifteen years. Sandwiches, a piece of pie and cake—the number of sandwiches may vary from three to six—made up of six or twelve slices of bread with a filling depending upon the imagination or mood of the moment of his wife. Even where cafeterias are available, it requires much ingenuity to inveigle a man to give up years of eating habits, to try "what is good for him". Many of these men,

on arriving home, assist their wives, who may also be working in industry, to prepare dinner.

In six small industries, employing an average of 500 workers, only three have cafeterias, and in two of these, less than half the workers use this facility, the remainder eat at their machines or in the shelter of a loading platform. The value of nutrition in these plants and in large industries, rests upon the education of management, foreman, and men, by the medical department. Much assistance can come from the general practitioners, who are in daily contact with their patients. Great strides have been made in this field since the beginning of the war, but much greater individual effort will be demanded of the medical personnel in industry and the general physician of an enquiring turn of mind.

THE WORKER

In some large industries and many smaller ones, the worker, your patient, has for years, been the most neglected factor in the art of manufacture. Manufacture is comprised of four components; management, material, machines, and man. Material is purchased according to highly fixed standards of quality and fabricated on machines of startlingly clever construction; costly machines cared for by a staff of experts to maintain operation at an efficient level, depreciated over a term of years and replaced when worn out.

Man, employed to operate these machines, while formerly taken for granted, used for long hours, not maintained or depreciated, but thrown out when his usefulness was over, is now slowly being recognized as an individual. Medical and trained personnel departments are looking on him as a very complex personality, who has either strength or brains or a combination of these for sale. Man also has a behaviour pattern with a more or less permanent stability, yet, subject to day by day attitudes, that must be more fully understood and protected. The employee, through the medical department, is being maintained in health, to permit him to operate his machine skillfully. When the worker's efficiency begins to fail, he is given less exacting duties. While retirement and pension schemes are slowly being planned for the long service employee, the technique of enjoying these years requires development.

MEDICAL EXAMINATION

On employment, today, the new employee must be medically examined, to assay his physical and mental capacity. There are few class "A" men as employees, but rather, young or older groups, physical unfits for the armed services, or men released from army duty as unable to carry on.

So, no longer can the medical department give to industry a large quota of physically fit men between 18 and 30 years of age, but, rather, must accept all men, if at all possible, and place them in the department where they will be most useful.

There are three main ideas behind the initial medical examination. (1) That the man be physically fit for the type of work available. (2) That he will do no harm to the men with whom he has to work. (3) That he will not harm the machine he is called upon to operate.

Very little of the worker's mental make-up can be judged at this examination, or even a history of past illness or accidents obtained, due to a natural tendency of man not to reveal any detrimental defect when seeking employment. A rather thorough medical examination however, is carried out, including examination of the blood for syphilis, the urine for diabetes or nephritis, and either a tuberculin test or immediate chest x-ray, depending on the type of industry. More recently, due to the demand for blood donors, hæmoglobin estimations have been made.

The results of the medical examination are entered on suitable forms, and filed in a locked compartment, as an individual record, a confidential document, not open to the scrutiny of management in any of its departments. On this form is also entered all accidents, major illnesses and any other facts pertinent to the story of this man's health, while employed.

The examination is unhurried, taking place in a private office, set aside for the purpose, with all the sincerity of a consultation in the office of any medical practitioner. Even the physical surroundings of the office are losing the factory atmosphere so that the man feeling outside industrial environment, will more honestly reveal the information desired.

Here too is kept a detailed description of each department within the industry, the occupational health hazard involved, the type of process, whether skilled or unskilled, the

weight of pieces of material and number handled per hour, the foreman's minimum requirements as to age and physical quality of his employees, the rate of pay and hours worked in this department, and finally, a very confidential record, compiled by the medical director and the manager, on the type of foreman under whom the man must work.

NURSING SERVICE

Every efficiently operating medical department will employ graduate nurses on the various shifts, the number required varying according to the hazards of the industry, or the individual interest of management in the welfare of their employees. One small industry employing 200 girls, working eight hours per day, employs two full time graduate nurses, for this manager feels he has a duty toward his workers, far and beyond the actual payment of so much money for so many hours worked, and his records reveal increased production with less scrap, less labour turnover, and less absenteeism.

The medical department in any industry will have visits by employees equal to four times the payroll each month, in other words, where 500 people are employed, there will be 2,000 visits to the first aid department monthly. Out of the many visits, fully one-half are for medical reasons, an aspirin tablet, an alkaline stomach mixture, or to discuss some sickness problem concerning the man or his family.

RECORDS OF ILLNESS

Quoting again from Dr. Greenburg:

"While industry is not in the practice of medicine, an attempt is made to conserve the health of the workers through general supervision and the detection and correction of physical defects.

"Illness among industrial workers causes an absence of approximately nine days each per year, and where female workers are employed, twelve days per employee per year.

"Gafafer, of the United States Public Health Service, has been conducting absenteeism studies in industry. In a recent paper, he points out that sickness experienced by a group of industrial workers during a particular period of time is not uniformly distributed among the group but concentrated, due to the fact that there exists certain repeater or sickness-prone workers. He says, 'In 1939, among a group of 3,000 male workers, 44.8% of the workers had no disability sickness of one day or more recorded for them, 31.5% had one sickness each, 13% had two sicknesses, 6.7% had three, 2.5% had four, 0.9% had five, 0.4% had six, 0.1% had seven and 0.1% had eight.' In other words, in male workers about 60% of the employees in this particular group were accountable for all of the illness, and about 30% had more than one illness each."

In investigating one small plant, employing 150 women, I found in the year 1943 that only 16% had no sickness, while 36% had from four to sixteen sicknesses.

From these figures, we may conclude, that we must determine those groups in the population who are sickness-prone, if we are to make any great inroads in the problem of industrial illness.

There is no one in a better position to find the sickness-prone individual than the plant physician. This is one of the most important public health problems before him.

The great bulk of illness is not directly attributable to industry, but occurs rather in industrial workers. The private physician must, by some arrangement, see more of the cases of non-occupational diseases. If this can be done the private practitioner will take a great part in protecting the health of the workers.

CONSULTATIONS

Many employees are seen by the medical director. In a 500-man concern, about 6 per day are interviewed, either at the request of the man, of the nurse as a problem she cannot handle, or of the foreman due to lowered efficiency, more than usual absenteeism or change in behaviour or attitude of an employee.

When it is realized that the workman spends more of his waking hours at his work, than he does at home, at church, at union or lodge meetings, you will understand the position of the foreman, personnel and medical department.

An unusual opportunity is given to watch the physical and mental health of the workingman as he grows old at his work, the effects of illness upon the man in his earning power, the influence of home anxieties on his behaviour, the responsiveness of man to such changing conditions as a new foreman or longer or shorter hours, the pride in his work, either individual or as a member of a department, even on repetitive jobs. As the years pass, his loyalty to the firm may be noted, as well as his ready response to praise, and although he rarely has more than the small area in which he works from which to judge the ultimate quality of the product, still, he will glow in the reflected glory of the fact that his particular product is on display at a war material exhibit or that his general manager is the chairman of a Red Cross campaign.

Many illustrations of these consultations could be given; let me cite but a few:

Duodenal ulcer.—A young man, refused military service due to a history of duodenal ulcer,

presented the problem of inability to take the proper dietary treatment while on night shift, a rather simple problem, which required a letter from his private physician as the man had not revealed this information about his ulcer when first employed. A visit to his home by the nurse to ascertain if the wife was working; there was a discussion with his foreman as to the type of workman, and finally a position was found to give the man permanent day work. This was all necessary investigation for there might have been an epidemic of duodenal ulcer in the night shift.

Heart.—A foreman, aged 53, handling a large department for thirty years, had a dizzy spell, retrosternal pain and a mild degree of shock. Taken home after preliminary sedation, his family doctor was called. When ready to return to work, the man visited the medical department with a letter from his physician stating that he should be relieved of his present position, and given work requiring less responsibility. The foreman's file did not reveal any notation of a previous heart episode, and his annual physical examination did not show any heart lesion. On being asked why he had not reported previous attacks, he summed it all up in the word "fear". He was afraid he would lose his job if he could not carry on in the same old "high-pressure way". The dispelling of "fear" and rebuilding confidence demands much time in patient understanding.

EDUCATION

Education in health matters begins at the monthly meeting between manager, superintendent, and medical director. Through this group the problems of the medical department are passed on to foreman and worker. The nurse and physician, by daily contact with workmen, have opportunities to discuss all angles of health, whether pertaining directly to the workman himself, or his wife or family.

Rehabilitation of the returning soldier, at present, is receiving much study and planned action, through conferences with management and veterans of the last war. Little difficulty is looked for in the old employee who has left his industry to serve, whether he comes home physically disabled or emotionally upset. Much patience will be required. The veteran, however, who enlisted at eighteen, never having worked in industry, will demand and deserve much careful thought and consideration by private practitioner and plant physician alike, in order to assist him to regain civilian status after several years of emotional bombardment under highly efficient regimentation and discipline.

Medical care of the industrial worker is health management or health maintenance. Preventive is not the word, rather, an understanding of how men live as individuals, as a society.

To general practitioners asked to assist as part-time physicians in industry, I can assure you, if you like people, that industrial medicine is a fascinating study, relatively new, and with possibilities only limited by your own imagination and enthusiasm.

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THIAMIN REQUIREMENT OF MAN AND THE BREAD PROBLEM

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IT is generally recognized that the whole kernel of wheat, in addition to being one of the staple sources of carbohydrate for most occidentals, is also an excellent source of most of the B vitamins, with the exception of riboflavin. It is also widely admitted that the standard grades of white flour are impoverished in nutritive value as a result of the removal of one-half to three-quarters of different B vitamins and a reduction in minerals. These statements are fully supported by evidence; for example, the review on flour and bread by Maynard[1] may be cited.

Attention to the impoverishment of white flour is not new; many of the early contentions, including those of Graham in England have recently been reviewed by Lepkovsky.[2] Since 1939 the problem has received marked attention in Great Britain, in the United States and in Canada. In each of these countries attempts have been made to reach solutions by different ways, which are quite familiar to all of us. The intense interest has been occasioned by several factors: (1) statements regarding allegedly prevalent deficiencies of the B vitamins, particularly of thiamin; (2) popular interest in

nutrition and especially in vitamins; and (3) availability of several vitamins at low cost, together with commercial exploitation of them. The principal argument for the addition of vitamins to flour or bread, or for the use of higher extraction flour, has rested in the past four years upon the contention that a deficiency of thiamin, or of riboflavin, or of niacin, is widespread and of real danger to health and efficiency. Most attention has been given to thiamin and I propose to limit this discussion to that vitamin, not because other B vitamins do not merit consideration, but because thiamin has been singled out in many discussions about flour.

Let us examine the Canadian situation with regard to thiamin deficiency. The disease beriberi, due to severe thiamin deficiency, is extremely rare in this country. The contention that there is widespread mild deficiency, or subclinical deficiency, to use a term popular at present, is based largely on the data secured in dietary surveys. Some seven or eight surveys of reasonable size have been carried out in Canada. The common practice has been to obtain records of food consumption for a week, to calculate the amounts of the various nutrients in the consumed food, and to assess these amounts in terms of approved standards of intake. All of the Canadian surveys, conducted in this way, have shown roughly the same picture. I shall refer to one in particular, choosing it because of familiarity, and using it as an example. Two years ago a nutritional survey was carried out on a large group of students in East York Collegiate Institute.[3] Assessment of the thiamin intakes in terms of approved standards showed that 56% of the girls and 70% of the boys had supplies which were less than 70% of the recommended allowance. Other Canadian surveys had shown much the same result. The East York survey differed from the others in that a great deal of information, in addition to the dietary data, was available; all of the students had thorough physical examinations and a number of special tests for nutritional deficiencies. The results of the examinations are shown in the accompanying table.

TABLE I.

APPRAISAL OF HEALTH AND NUTRITIONAL STATUS BY PHYSICAL EXAMINATION

	Girls percentage	*Boys percentage*
Health:		
Excellent	14	37
Good	64	48
Fair	21	14
Poor	1	0
Nutritional status:		
Excellent	52	65
Good	26	12
Fair	20	22
Poor	2	1

It should be noted that the dietary data, when assessed in terms of recommended allowances, showed alleged deficiencies of other nutrients in addition to thiamin. There, then, was a group of 546 young people, possibly typical of many thousands in Canada, who had apparently poor supplies of thiamin but who were mostly in excellent or good health. This obvious discrepancy may be due to one or more of at least three factors: (1) It is possible that the procedures used to determine the state of health were not sufficiently sensitive to detect subclinical thiamin deficiency; (2) a record of food intake for one week may not be a true picture of food habits; (3) the recommended allowance of thiamin, used as a standard of assessment of intake, may be too high. The last two causes of error, and others not here listed, operate in all dietary surveys, but are ignored frequently when general conclusions are drawn regarding the existence of deficiencies.

While it is likely that all of the three causes of discrepancy operate, I am convinced that it is time to give serious consideration to the recommended allowance for thiamin, promulgated by the U.S. Food and Nutrition Board and approved by the Canadian Council on Nutrition. That allowance is roughly based on a ratio of 0.6 mgm. thiamin per 1,000 calories; the recommended allowance for a man doing moderate work and expending 3,000 calories per day is 1.8 mgm. It should be made clear that this recommended allowance, as in the case of recommendations for other nutrients, was not made to provide a standard of adequacy but to furnish a goal for optimal nutrition. If used only as intended the recommended allowance would be great enough to be a difficult goal; it has been used frequently, however, as a gauge of adequacy. The principal interpretation of dietary surveys is based upon whether a given intake is below the recommended allowance. The validity of the interpretation, and consequently, the correctness of most of the claims for widespread deficiencies, rest upon the question as to whether people who do not secure the recommended allowance for thiamin should be considered to be deficient. It is true that a large percentage of persons studied in surveys in

Canada and in the United States have apparent intakes less than the allowances; unfortunately, there is insufficient evidence to say that their health is impaired by the alleged deficiency.

I propose to consider briefly whether the recommended allowance for thiamin is a proper gauge of adequacy. It has been firmly established that thiamin acts as a constituent of cocarboxylase and is essential for the normal utilization of carbohydrates. It appears to be necessary, also, for the metabolism of protein but not for that of fat. An increase in the amount of dietary fat has a sparing action on the need for thiamin. It has become the custom to calculate thiamin requirements as related to the intake of calories; more properly, the thiamin requirement is probably more closely related to the intake of non-fat calories, that is, the amount of carbohydrate and protein. It is reasonable to assume that the function of thiamin is about the same in all mammals; the thiamin requirement of rats should be the same as that of humans, calculated per 1,000 calories or per 1,000 non-fat calories. Moreover, it would be expected that the thiamin requirement, calculated on such a basis, would be the same at any age; this was experimentally shown to be the case by Arnold and Elvehjem.[4] Consequently it is possible to compare measurements which have been made of requirements for different species at different ages. A number of such determinations have been made; these have been reviewed and, whenever possible, the results have been calculated as milligrams of thiamin per 1,000 calories. Because dietary fat spares the need for thiamin, an attempt has been made to plot the determined thiamin requirement against the percentage of the total calories supplied by fat.

It should be pointed out that the criteria used to estimate the requirement have varied considerably; in some cases the amount of thiamin necessary to give a maximal gain in weight of young animals has been considered the optimal requirement, while in humans the requirement has been assessed in terms of urinary excretion, of work performance, or of various physical signs and symptoms. This variation in criteria makes a comparison difficult but it is interesting to consider the results. These are shown in an accompanying graph (Fig. 1).

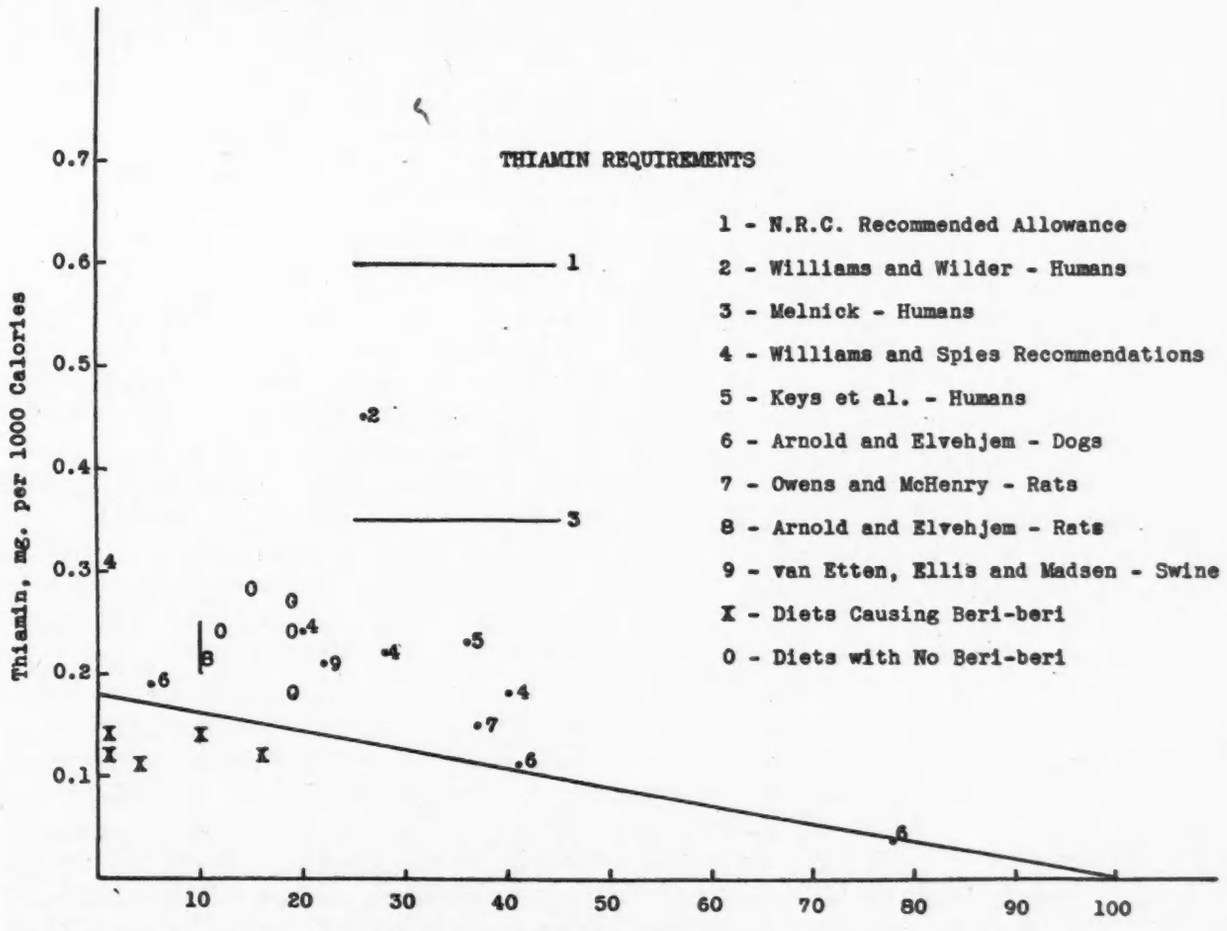

Fig. 1.—Percentage of total calories from fat.

Several observations are in order. All of the experimentally determined requirements for various species lie on or above a line which gives a thiamin allowance of 0.19 mgm. for a fat-free diet and which provides no thiamin on a diet containing all fat. Below this line are the thiamin contents of five of a number of diets recorded by William and Spies as ones which caused beri-beri in humans, while above the line are values for five diets on which beri-beri did not occur. This line might, then, be assumed to show minimal requirements, below which health is definitely endangered. If we make this assumption that minimal requirements for diets containing varying amounts of fat can be obtained in this way, we must recognize that these are requirements for the prevention of acute deficiency but that optimal recommendations are probably above this level. Dietary surveys in Canada have shown that people choose food supplies which contain fat equivalent to about 40% of the total calories. It could then be said that minimal thiamin requirements for Canadians would be approximately 0.17 mgm. per 1,000 calories. Most of the thiamin intakes which have been recorded in Canadian surveys have been above this level, which explains, probably, the almost complete absence of beri-beri.

In practically all observations of the effects of vitamins upon animals it has been found that a minimal amount, necessary to protect against frank deficiency symptoms, is not sufficient for maximal growth or maximal health. It has also been found that an optimal requirement can be determined and that supplies in excess of this amount provide no additional benefits in growth or in health. From this analogy it can be assumed that the desirable intake of thiamin for humans is the optimal amount and not the minimum required to protect against obvious disease. Opinions vary considerably as to optimal requirements. The N.R.C. recommended allowance is based largely upon two sets of observations: (1) by Williams and Wilder,[5] who found that the optimal amount for humans subsisting on a diet in which 27% of the calories was supplied by fat was 0.45 mgm. per 1,000 calories; (2) by Melnick,[6] who reported an optimal figure of 0.35 mgm. per 1,000 calories but who did not give any information about the fat content of the diet. By adding a safety allowance of about 50% the recommended allowance of 0.6 mgm. per 1,000 calories was obtained. Keys and associates[7] have recently reported that amounts of thiamin in excess of 0.23 mgm. per 1,000 calories provided no additional benefit. In their experiments a diet in which 36% of the calories was furnished by fat was employed. This is not much different from the type of food intake used by most Canadians. There are two other observations which are available for this type of diet, supplying about 40% of the calories from fat, one by Arnold and Elvehjem[4] on dogs, in which an optimal intake was found to be 0.11 mgm. per 1,000 calories, and experiments on rats in our laboratory,[8] in which the optimal requirement was found to be 0.15 mgm. per 1,000 calories. These two observations are in good agreement and somewhat lower than the figure given by Keys *et al.* All of these three estimates are very much below the recommended allowance now in use.

Let us assume, for the time being at least, that a suitable optimal allowance for thiamin is 0.23 mgm. per 1,000 calories. I wish to return to consideration of the East York survey. It will be remembered that originally we assessed the actual thiamin intakes in terms of the 0.6 mgm. allowance and found that about two-thirds of the students had definitely deficient supplies but a good level of health. We have re-assessed the thiamin supplies in terms of the 0.23 mgm. allowance.[9] On this basis only 2% of the students had poor supplies of thiamin. This is in much better agreement with the health status found by careful physical examination.

It is my opinion, based on evidence now available, that the allowance for thiamin now commonly recommended is much too large and that, because of the use of this excessive allowance as a dietary standard, a great deal of the alleged deficiency is really non-existent. I would like to make clear, however, that while I believe the recommended allowance could be markedly lowered, there is not sufficient information at present to decide accurately what the optimal requirement for humans really is.

If the principal basis for claims of widespread thiamin deficiency is an artefact, the main reason for the present heated controversy about flour and bread largely, but not entirely, disappears. A conclusion might be reached hastily that the vitamin content of bread is comparatively unimportant. If a much lower standard of adequacy is correct for thiamin, the thiamin

content of bread is of less importance, provided that people use a varied diet containing a number of food sources of thiamin. It should be made clear, however, that bread is a basic food liberally consumed and bread of high nutritive value is still advisable and is essential if supplies of meat, eggs, milk and other good sources of thiamin are restricted. Moreover, thiamin is only one of a group of vitamins which can be supplied from wheat. Bread of high nutritive value can be most economically obtained by retention of all of the nutrients found in whole wheat. Incomplete restoration of vitamins to flour impoverished during milling is not a satisfactory method to obtain bread of high nutritive value.

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RÉSUMÉ

Le besoin minimum de thiamine pour le consommateur canadien moyen est approximativement établi à 0.17 mgm. pour 1000 calories. Le taux de thiamine du pain est relativement peu important pourvu qu'on remplace cette vitamine par d'autres sources vitaminiques puisées dans un régime très vari. Cependant, le pain étant un aliment de base très répandu et abondamment consommé, nous devons veiller au maintien de ses qualités nutritives; du reste, d'autres vitamines importantes sont également contenues dans le blé. C'est le pain complet qui est le meilleur véhicule de ces vitamines. Les vitamines ajoutées au blé moulu réalisent un pis-aller qui n'est pas satisfaisant. JEAN SAUCIER

United States vital statistics show that the lowest death rate on record, 10.3 per 1,000, was recorded in 1942. The birth rate was 20.7 as compared with 18.7 in 1941; infant mortality continued to decrease; and the maternal mortality rate dropped for the 13th consecutive year to about 3 deaths per 1,000 live births. For the first six months of 1943, however, the statistics indicate slightly less favourable conditions as reflected by communicable disease returns and estimated death rates. For the first five months the provisional death rate was 11.2 per 1,000, or 0.31 higher than that for the first five months of 1942. The increase was due chiefly to a greater number of deaths from cardiovascular diseases, although increases in the deaths from some of the childhood diseases and from cerebrospinal fever have also been factors, although less important numerically. It is interesting to note that there has been no indication of increased mortality from tuberculosis in the United States since the beginning of the war and that, indeed, the death rate from this disease has been lower than in 1939 and 1940.—*J. Roy. Inst. Pub. Health & Hyg.*, 7: 2, 1944.

THE EFFECT OF VITAMIN E UPON IMPAIRED KIDNEY FUNCTION

(Preliminary Note)

By Evan Shute, B.A., M.D., F.R.C.S.(C)

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PREGNANCY is an extraordinary test of kidney function, and often what amounts to a laboratory experiment in substandard nutrition as well. Early in our work with vitamin E we were impressed with its value in preventing in pregnancy such gross evidences of impaired renal function as albuminuria, œdema, and even hypertension. A summary of this experience has been published recently.[1] Individual cases have been seen, too, suggesting that œdema, even of long standing, may sometimes melt away before vitamin E.[2] Indeed, some œdematous pregnant women have reported an increased urine volume ensuing immediately on its first administration.

What effect could vitamin E have on kidney damage of several or of many years' duration?

Kidney function is difficult to assay satisfactorily, of course, but it is possible to do simple two-hour concentration tests repeatedly, at short intervals, on private patients, and this index of function is relatively efficient. Accordingly, it was the test chosen as our criterion, much as it left to be desired.

Up to the present we have collected observations on 13 women. These women gave evidences suggesting either chronic nephritis or impaired renal function, such as chronic œdema not cardiac in nature, or hypertension. Some were post-puerperal, the pregnancy having been characterized by toxæmia. Wherever possible two separate tests of the woman's kidney function were made before treatment was begun. Therapy consisted of a two-weeks' trial of 25 mgm. ephynal (synthetic alpha-tocopherol) per day. At the end of the two weeks the two-hour test was repeated and the patient examined for clinical improvement. Of the 13 cases benefit was observed in ten. A few of the typical patients in the group are briefly described below.

CASE 1

Mrs. G.M., aged 31 years, had had a toxic pregnancy characterized by great œdema, ending in the birth of a badly deformed child. A second pregnancy was normal except for slight œdema of the fingers in the last month. It resulted in the birth of a child having congenital heart disease, which soon died. When seen three years later her hands and ankles were somewhat swollen. She

was no longer able to knit, for example. A two-hour test gave a day to night volume of 19 to 6, and the specific gravities ranged from 1.010 to 1.017. The test was repeated in two weeks; and the day to night ratio then was 10 to 6 and the gravities ranged from 1.005 to 1.016. She was given 25 mgm. per day of ephynal (Hoffmann-LaRoche), per day. At the end of another two weeks her ratio was 12 to 15 and the gravities ranged from 1.022 to 1.030. Her hands had lost their œdema by this time—even her friends had commented on this! She was taken off the treatment and tested six weeks later. The ratio then was 28 to 22 and the gravities ranged from 1.000 to 1.012. She volunteered that she had scarcely been able to flex her hands or feel with her fingers in the preceding week. She returned to vitamin E therapy and has been well for the six months' period that has elapsed since. She has never shown albuminuria since her first pregnancy.

CASE 2

Mrs. A.J., aged 20 years. This patient had had an uneventful history until her first pregnancy began in July of 1942. She had a number of hæmorrhages during pregnancy, and developed a minimal leg œdema at five months. Salt restriction controlled this very well. She had a normal child at term, with a blood pressure of 150/84 and no albuminuria. Six weeks later her pressure was 140/100 and there was still a good deal of ankle œdema. A two-hour urine test was done. The day to night volume was 9 to 7, and the gravities ranged from 1.010 to 1.021. She was given 25 mgm. ephynal per day and the test repeated in two weeks, at which time the ratio was 6 to 8 and the gravities 1.012 to 1.036. There was no albuminuria at any time. A year and a half later her pressure was 120/76, and her last urine test showed a ratio of 13 to 11 and gravities ranging from 1.013 to 1.024.

CASE 3

Mrs. L.H., aged 34 years. This patient had had an uneventful history until her first pregnancy in 1939. Her final pressure then, before labour, was 150/98, without œdema or albuminuria. Her pressure 11 weeks later was 136/76 and she appeared otherwise normal. There was a spontaneous abortion at two months two years later. This was followed by shock, a transfusion, and a mild sepsis. Three years after that, when seen again, she complained of a "thick head" and worry. Her pressure then was 172/98. Her two-hour test showed a day to night ratio of 23 to 12, and her specific gravities ranged from 1.002 to 1.010. She was given 25 mgm. of ephynal per day for two weeks, when the ratio became 25 to 18 and the gravities ranged from 1.009 to 1.030. She was not seen, and had no further treatment, for nine months. Then her blood pressure was 140/80, her ratio was 28 to 16 and her gravities ranged from 1.003 to 1.018. She was given ephynal for two weeks as before. At the end of that time her ratio was 18 to 15 and her gravities ranged from 1.008 to 1.028 and her pressure was 146/76.

CASE 4

Mrs. F.G., aged 25 years. She had had some œdema of the hands and feet for years, with much urinary frequency. There was no albuminuria nor hypertension. A two-hour test showed a ratio of 23 to 27 and specific gravities ranging from 1.016 to 1.026. She was given 25 mgm. of ephynal per day for nearly two months. At the end of that time her ratio was 22 to 4 and the gravities ranged from 1.006 to 1.021. But her ankles and hands were free of œdema for the first time in years! She has remained well since, and now is four months' pregnant with a blood pressure of 142/74, no albuminuria, and feels well.

CASE 5

Miss M.W., aged 39 years. She came complaining of dizziness and headaches, with a normal pressure and no albuminuria. Her two-hour test showed a ratio of 42 to 36 and a specific gravity ranging from 1.007 to 1.012. She was given 25 mgm. of ephynal for two weeks. At the end of that time she felt "much better", her ratio was 16 to 27, and her gravities ranged from 1.013 to 1.024.

CASE 6

Mrs. B.C., aged 40 years. She had had two spontaneous abortions, with a blood pressure of 158/100 just after the second one. As she was very anxious for a baby her two-hour kidney function test was done. It showed a day to night ratio of 70 to 21 and specific gravities ranging from 1.003 to 1.013. After two weeks of 25 mgm. ephynal per day, the ratio was 55 to 31 and the gravities ranged from 1.010 to 1.025. Her blood pressure at this time had dropped to 144/88.

Two other cases, illustrating the effect of vitamin E on damaged kidneys, are given here.

A CASE WITH POST-PUERPERAL HYPERTENSION

Mrs. W.H., aged 25 years, came in on May 21, 1942. She gave a history of having had an abortion at 15 weeks, some six weeks previously. She reported that before her abortion she had had blurred vision and very severe headaches. She did not know what her urine and blood pressure had shown at that time. When I examined her she was bleeding, and I did not get a urinalysis, therefore, but her blood pressure was 142/98. As she was leaving for a distant city in three days and desired to know what she should do regarding future pregnancies, she was given 10 mgm. of ephynal per day for those three days. At the end of that time her blood pressure was 116/70. She conceived three months after that, and when seen in the third month had a pressure of 134/76. Five months later her pressure was 120/80. She had an uneventful pregnancy, but for vomiting controlled by testosterone propionate.[3] She came to term with a slight œdema and a pressure of 130/80, and delivered an 8 pound 5 ounce girl. There was an infarcted area 1½ inches square in the placenta at one margin, despite the 10 to 20 mgm. of ephynal per day which she had had during pregnancy. She has been well since.

A MAN HAVING TRUE NEPHROSIS

Mr. A.H. (courtesy Dr. A. G. Morris). This man, aged 43 years, was a printer. He came to Dr. Morris December 27, 1940, complaining of swollen legs and ankles. His urine was full of albumin. His blood pressure was 180/100 at this time. He was given a milk diet with salt restriction, and put to bed for three weeks. At the end of that time his pressure was 150/90, and his albuminuria and œdema were unchanged. On January 27, 1941, his serum albumen was 1.9%, serum globulin 2.9%, his weight was 153, and, at the writer's suggestion, he was given a tablespoon of Kelly's wheat germ oil per day. By February 13, his albuminuria had been halved and his pressure was 150/80. He had been ambulant on this treatment. By April 16, his weight had fallen to 150, his pressure to 135/75, and he had lost his œdema, even when at work. He continued with his wheat germ oil. By May 5 his pressure had fallen to 120/80, but he again had a 4-plus albuminuria and a weight of 152. At this time however, his serum albumen was 2.9% and his serum globulin 1.8%. After July of that year the patient took only a dessertspoon of oil each day. By December of 1941 his pressure was 140/80, his weight 141, and his urine showed a 3-plus albuminuria. By April of 1942 his albuminuria was greatly improved and his E therapy was discontinued. One year later his albuminuria was one plus. In September, 1943, he showed only a faint trace of albumin. He was on ordinary diet after January, 1941, lost no time from work, and had no complaints of any kind thereafter.

DISCUSSION

The patients chosen for the primary experiment were women whose evidence of renal impairment was definite and of some duration. No doubt better results could have been achieved sooner, which brings up the effect of such treatment on acute nephritis or acute nephrosis. I suggested at the Vitamin E Symposium[2] held in England just prior to the war that a new approach to the problem lay in this direction.

It is of interest that Martin and Moore[4] in their report on the pathological changes found in the kidneys of rats long deprived of vitamin E mentioned extensive degeneration of the renal convoluted tubules, although the loops of Henle and the collecting tubules also were involved. In advanced stages most of the convoluted tubules lost their epithelium completely, although the animals continued to survive. The glomeruli showed little or no change. Such degeneration could be prevented if the rats were given vitamin E.

It is the convoluted tubules which have the function, apparently, of concentrating the urine. Our case records indicate that it is the ability to concentrate urine which is especially benefited by E-therapy in women with damaged kidneys. That is what one would expect, if the rat experiments cited above are relevant. The effect upon hypertension of long duration has been disappointing, on the other hand, despite the good results achieved in many pregnancy toxæmias during pregnancy itself, and in the one post-puerperal patient described above. Any effect that E-therapy can exert on this aspect of renal impairment must be prophylactic, it would seem. When the pressure has become fixed at a high level it is difficult to budge it.

Nephrosis is primarily a disease damaging renal tubules, it is believed. The single case quoted is the only one we have had an opportunity to treat, but the results are suggestive, and it is hoped that those with better facilities for the study of such cases may feel inclined to try vitamin E in their management, and decide whether it has value or not.

SUMMARY

1. Histories are presented which indicate that treatment with vitamin E may improve damaged kidney function, even when the damage has been of some duration. The improvement develops quickly, but is transient unless therapy is continued.

2. The improvement is apparently limited, in most cases, to the tubular system of the kidney.

3. The case history of a true nephrosis is presented. This suggests that E-therapy may play a rôle in its management.

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RÉSUMÉ

Treize femmes, enceintes ou en suites de couches, atteintes de déficits rénaux à des degrés divers: œdème, hypertension, albuminurie, furent soumises à la vitamine E-thérapie. Dix ont bénéficié du traitement. L'amélioration s'installe rapidement mais celle-ci n'est que transitoire si la thérapeutique n'est pas continuée. Il semble que la vitamine E agisse exclusivement sur les tubules et ait peu d'influence sur les glomérules. Un homme atteint de néphrose lipoidique a vu la plupart de ses symptômes disparaître à la suite de ce traitement.

JEAN SAUCIER

TOXIC REACTIONS FOLLOWING SALICYLATE THERAPY

(A Review of the Literature and Clinical Reports)

By Surgeon Lieutenant Henry Z. Sable, R.C.N.V.R.

THE salicylates, particularly acetylsalicylic acid, are among the most freely used and abused drugs in the pharmacopœia. Among physicians and laymen alike much confusion has existed concerning the degree of safety with which these drugs may be administered. Indeed, on seeking more accurate information in the literature, one is struck by the fact that on almost any point completely divergent (and thoroughly "substantiated") opinions may be found.

THE PROBLEM OF DOSAGE

The level of dosage has always been a matter of individual preference, with wide variations and no generally accepted scheme. With the exception of accidental or intentional overdosage, the highest levels have been used in the treatment of acute rheumatic fever. The effect of these drugs on the course of the disease has been a matter of disagreement for many years. A recent and widely accepted textbook by Good-

man and Gilman states that ". . . the migrating polyarthritis responds in a remarkable manner, the course of the disease . . . and the complications are not changed by salicylates". Cecil does not state whether he believes the drug has any effect on the disease. Numerous authors quoted by Hanzlik believe that there is benefit to the myocardium by virtue of the fact that the pulse rate is decreased by salicyl compounds. English and Canadian workers have long advocated doses of 10 gm. daily, and higher, but many American workers, S. Shapiro, K. Dodd and others, think of dosage under 7 gm. daily when they speak of "large doses". The chief deterrent in massive dosage has always been over-regard for the patient's subjective well-being. However, as a result of recent work by Coburn and his collaborators, the value of high blood levels of salicylate appears established (Coburn recommends a blood level of 36 mgm. per 100 c.c.), and it may be necessary to ignore the patient's early complaints.

Table I, with explanatory comment, is offered in support of the view that large doses are tolerated well. Cecil states that some patients tolerate acetylsalicylic acid better than sodium salicylate; this difference was not noted in our series.

TABLE I.

SUMMARY OF SURVEY OF 51 UNSELECTED CASES RECEIVING VARIOUS DOSES OF SALICYLATES ON 4-7-44

Type of therapy	*Symptoms*						
	Vertigo	*Tinnitus*	*Headache*	*Nausea*	*Vomiting*	*Deafness*	*Completely symptom-free in later stages*
Group I. Early in the course of therapy, 18	1 (6%)	1 (6%)	4 (22%)	1 (6%)	0	2 (11%)	17
Later in the course of therapy, 18	1 (6%)	0	0	0	0	0	(94%)
Group II. Early in the course of therapy, 33	3 (9%)	15 (45%)	6 (18%)	17 (51%)	8 (24%)	8 (24%)	23
Later in the course of therapy, 32	3 (9%)	5 (16%)	1 (3%)	3 (9%)	0	1 (3%)	(72%)

Group I consists of 18 patients who received 0.0 to 1.7 grams of salicylate daily.

Group II consists of 33 patients, of whom 31 received 8.3 to 13.3 gm. daily. One received 5 gm. daily and one received 16 gm. daily. One patient in this group was nauseated and vomited so severely during the first week of therapy that the large dose was discontinued and 1.7 gm. daily substituted. As a result "Group II—Late" consists of only 32 patients.

The discrepancy between the numbers symptom-free in the later stages is not great, and is minimized by the following observations. Two of the patients in Group II complained of tinnitus and nausea in the early stages on 8.3 gm., and later tolerated daily doses of 10.0 and 13.3 gm. respectively. In all other cases in which symptoms were recorded in the late stage, the qualifying notations "mild" and "infrequent complaints" were made. In no case were the symptoms constantly present. Early intolerance was followed in most cases by complete or almost complete tolerance.

No albuminuria or other urinary abnormalities were found in routine weekly urinalysis. There was no evidence in the peripheral blood of any depression of bone marrow function. During the winter and spring only rare minor nose-bleeds were noted, but by midsummer one patient developed severe nosebleeds and was found to have prolonged prothrombin time.

CLINICAL REPORTS

During the late autumn, winter, spring and summer of 1943-1944 more than 100 cases of acute rheumatic fever were treated in a Royal Canadian Naval Hospital with large doses of salicyl compounds. Only a small number of these showed reactions of a moderate or severe degree.

Four cases were noted in which hyperpnœa was an outstanding symptom, and of these, one is reported. Two cases occurred in another R.C.N. hospital and showed other manifestations of salicylism.

The accompanying table represents a survey of 51 unselected patients who were receiving various doses of salicylate drugs. The patient's evaluation of the symptoms was taken at face value in all cases.

CASE 1

O.A., O/S, R.C.N.V.R., aged 19. Admitted 3-2-44. Clinical diagnosis: Acute rheumatic fever. Paternal grandmother has severe asthma, otherwise no personal or family history of allergy.

On admission the patient was acutely ill, with several acutely inflamed joints, and a very inflamed throat. Oral doses of aspirin and sodium bicarbonate, each 10 gm. daily, were begun on 3-2-44. On 14-2-44 the patient first complained of difficulty in breathing, even through his mouth. A few high pitched rhonchi were heard in the left anterior chest. On 15-2-44 his face was flushed, and temperature was 101°. That night desquamation of the hands and feet began. The next morning this was very marked, and the tongue was shiny and red. On 17-2-44 hoarseness was noticed, and respiration appeared laboured, with no complaints of shortness of breath. During the night respiration was noisy and rapid, and in the morning hoarseness and desquamation were more marked. On 20-2-44 severe nausea began: the patient was unable to take medicine or food without vomiting. On 21-2-44 he reported occasional attacks of dyspnœa. "Patient looks very weak. All joints normal for the first time."

On 23-2-44 all medication was stopped because of nausea and vomiting. The next day there was recurrence of pain, swelling and redness in the left knee. He continued to feel weak; feeding himself appeared to be a distinct effort and he spoke in a whisper. He no longer complained of sore throat. His temperature was normal. Therapy was recommended on 25-2-44. On 1-3-44 he vomited a large amount and was nauseated during the next three days. On 4-3-44 the hyperpnœa became much more marked. On 6-3-44 the respiration was described as "sighing and gasping". He did not feel short of breath at this time. He was completely unable to phonate. A small papular eruption of an acneiform type was noted on the upper chest, shoulders and back. By 9-3-44 the eruption had progressed markedly, showing papulo-pustules with involvement of the face as well. All medication was stopped and local treatment begun. Temperature continued to be normal.

At this time it was considered that the hyperpnœa might be functional, with the aphonia secondary to hyperventilation, or possibly another symptom of a functional disturbance. Hyperthyroidism was ruled out by the absence of any other signs of the disease. Chest x-ray was clear. On 10-3-44 respiration appeared normal.

By 11-3-44 there was noticeable improvement of the skin lesions, hyperpnœa had vanished and phonation was returning. On 13-3-44 the patient felt considerably stronger.

On 20-3-44 he began to produce blood streaked mucoid sputum and right basal bronchopneumonia was found. Recovery from this was uneventful on sulfadiazine therapy.

On 18-4-44 oral administration of sodium salicylate and sodium bicarbonate, each 13.3 gm. daily, was started. The patient vomited once the following morning, but thereafter and until discharge on 4-7-44 he complained of no ill effects.

DISCUSSION

The syndrome of salicylism.—The toxic effects of salicylates have been known for 70 years. Quincke states that the following symptoms were recognized as early as 1876: headache, dizziness, tinnitus, impaired hearing, nausea, vomiting, weakness, collapse, delirium and subnormal temperature. He also mentions albuminuria as a finding in these cases. The first six symptoms listed are still recognized as the earliest and commonest manifestations of salicylate intoxication or salicylism. Other symptoms are dimness of vision, thirst, diarrhœa, and profuse perspiration. To these, hyperpnœa, hæmatemesis and allergic manifestations must be added. Reference should also be made to hypocoagulability of the blood and to depression of bone marrow function, although the evidence on the latter point is unsatisfactory.

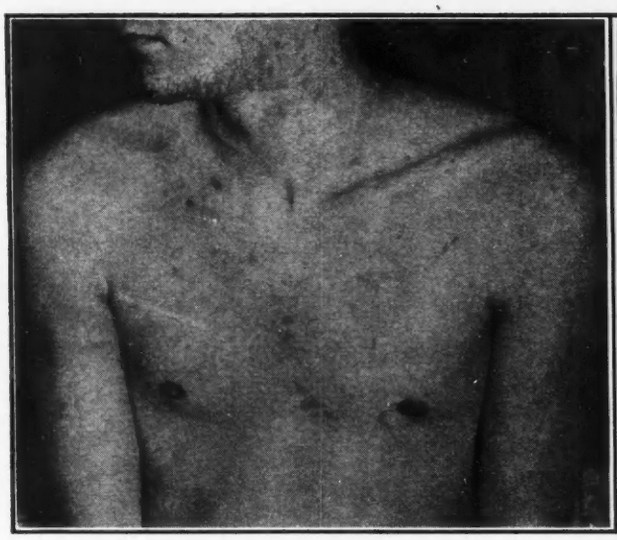

Fig. 1

Fig. 2

Figs. 1 and 2. Case 1. O/S, R.C.N.V.R. These photographs were taken approximately two weeks after onset of the rash. They show the distribution, but not the severity of the condition.

Cases of massive overdose have been described by many authors. The amount of salicyl compounds which can be ingested without fatal effect is variable. Goodman and Gilman state that 10 to 30 gm. ingested at once have constituted a lethal dose, though not invariably so. Balazs reviews 752 cases of attempted suicide in Budapest, using acetylsalicylic acid, of which 4 were fatal: one after 20 gm., and the others

after 30 to 40 gm. were taken. However, the amount ingested by the patients in this series varied from 5 to 95 gm. It is interesting to observe that in most cases such large amounts were taken in the belief that the drug was innocuous and the "suicide" was attempted as a last resort in love affairs. Oakley and Donnell report a case of recovery after taking 65 gm. of aspirin.

The symptoms and signs are headache, dizziness, tinnitus, partial deafness, nausea, vomiting, heartburn, associated with prostration, dehydration and thirst. The face is usually flushed, but may be pale. There is a rapid small pulse, rarely bradycardia. The blood pressure may fall, and other signs of cardiovascular collapse may ensue. Polyuria is an early manifestation, followed by oliguria and anuria as intoxication progresses. Generally there is a small elevation in temperature, which may be related to the effect on the heat regulating centre. Barnett *et al.* do not find hyperpyrexia a prominent symptom.

The respiration is affected even in mild cases. In moderately severe cases the respiration is accelerated and deep, often of the Kussmaul type. This generally lasts 24 to 48 hours if the patient remains untreated. Severe cases show the picture of acidosis and the alkali reserve drops as low as 30 to 40 volumes %. It is for this reason that so many authors use alkali in the treatment of the syndrome. This question is also discussed in the section on pharmacology.

In very severe cases there is profuse perspiration associated with depressed temperature. These cases die with progressively increasing signs of heart failure. The cause of death is not acidosis, since in one of the fatal cases it was possible to administer enough alkali to restore normal alkali reserve, yet the patient died of heart failure. Respiratory failure may also ensue in the late stages.

Some authors point out that there is no effect on the level of erythrocytes or leucocytes in the blood. Hawkinson and Kerr report a case in which granulocytopenia, severe anæmia and staphylococcæmia appeared in a patient who had been taking 2.7 to 4.0 grams of aspirin daily for several years. They consider this the only important etiological factor, although there is also a history of the patient receiving scarlet fever toxoid, which was followed by a severe reaction, shortly before her terminal illness.

Acetone frequently appears in the urine; albumin, casts, red blood cells and white blood cells may also occur. A case of psychosis composed of periods of coma and manic excitement has been described. Irritability is common, and occasionally convulsions occur.

There is considerable difference of opinion about skin reactions. Balazs states that exanthemata, œdema and other urticarial phenomena are not seen. Quincke states that erythema and urticaria are seen in cases of sensitivity or overdose. A case of erythema, desquamation and acne is reported in this paper. Coburn mentions a case of severe pustular acne, but this preceded the salicylate therapy. He also reports a case of diffuse maculopapular eruption in a patient to whom large doses were administered.

Pharmacology: In view of the renewed interest in the use of salicylates, some discussion of the pharmacology is in order. For a complete treatment of this subject the reader is referred to two articles in which much valuable detail is available.

Most salicyl compounds are absorbed equally well. Excretion is rapid and the blood is usually free of salicylate ion within 48 hours after withdrawal of the drug. The total excretion in rheumatic fever patients appears to be about 15% less than in normal individuals. The difference is greatest shortly after therapy is begun, and the blood level at the point of toxicity is also less in rheumatic individuals. Lessened excretion was also shown in such differing conditions as chronic alcoholism, morphinism and tuberculosis. The administration of sodium bicarbonate has practically no effect on the excretion of salicyl in the urine. The concentration is the same in the blood and joint fluids of rheumatic individuals. No free salicylic acid is demonstrable in the joint fluid.

The commonest symptoms are *nausea, vomiting, tinnitus* and *partial deafness.* There is no doubt that the gastric mucosa is irritated by the drug. *Hæmatemesis* following aspirin administration has been reported and gastroscopic study showed hyperæmia followed by extravasation of blood shortly after the drug came in contact with the mucosa. It has also been shown that aspirin causes gastric retention. Thus, though there is an indubitable local effect, there is also a central emetic effect, since the dose required to produce vomiting is smaller with intravenous administration than with oral administration. *Melena* has been found and its etiology is the same as that of the hæmatemesis.

There is no unanimity of opinion regarding the cause of tinnitus. The deafness is a subjective complaint and there is no evidence regarding the degree of loss (if any) of auditory acuity. No direct explanation of the phenomenon has been offered, but it may be part of the central effect, which includes stimulation in the early stages, followed by confusion and depression, of the central nervous system.

Hyperpnœa was first reported by Quincke, who applied the name "salicyl dyspnœa" to this phenomenon. He observed that with prolonged use of sodium salicylate there might be increased respiration. The rate or the depth or both may increase, but there is never a decrease, although a normal rate with increased depth might give the impression of decreased rate. The respiratory volume in a case of poisoning has been reported as high as 37 litres per minute one day after the drug had been withdrawn, returning to a normal level of 5 litres per minute 48 hours later. Quincke compared the symptoms with those of diabetic acidosis and treated his patients with alkali. Langmead in 1906 also treated his patients with alkali. Some of his patients showed concomitant starvation and acetonuria, and ketosis cannot be ruled out as a cause of hyperpnœa in his series. The etiology was held to be acidotic at first, but in the past 25 years much evidence has accumulated to indicate that this view is fallacious. At present there are two schools of thought. Bowen *et al.* describe a case and compare the symptoms of salicylate poisoning with those of diabetic acidosis. However, they observe that there is considerable disparity between the degree of hyperpnœa and the decrease in alkali reserve. They review the literature, but do not subscribe definitely to either point of view.

The majority of authors refer to the symptom as dyspnœa. Quincke states that there is frequently, but by no means always, a subjective feeling of shortness of breath in these cases. Bowen *et al.* refer to "hyperpnœa" in their case. In the case reported in the present paper there was a subjective feeling of shortness of breath at any time during the presence of hyperpnœa.

Renal damage which is present in intoxication is not permanent. The presence of urobilin, urobilinogen or sugar in the urine is interpreted as evidence of liver damage. Numerous authors have reported that definite albuminuria follows the administration of salicylates to normal, febrile, rheumatic and non-rheumatic subjects. The albuminuria is renal in origin, and in experimental animals concurrent renal changes are found. In small doses salicyl causes diuresis. Large doses cause partial suppression of water excretion by the kidney. This is due in part to diaphoresis, but is also due to a definite diminution in renal functional efficiency. This was shown in normal human subjects whose body weight increased after clinical doses, unless modified by diaphoresis. The retention is chiefly in the tissues, since there is no evidence of hæmodilution. This phenomenon has been called "salicyl-œdema" but in no case does it reach the stage of a pitting œdema. A moderate decrease in renal functional efficiency is also shown by raised blood urea nitrogen or non-protein nitrogen, in the acute stages, and diminished phenolsulphonphthalein excretion.

Salicyl has no effect on the underlying infectious agent in rheumatic fever, nor on the immune responses, but it does affect the sterile reaction that occurs during the activity of the rheumatic process. Lutwak-Mann demonstrated a profound effect on enzymes in the living animal, as shown by the disappearance of liver glycogen soon after injection of salicylate, with reappearance within 24 hours. The oxidation of dihydroxyacetone by liver slices from vitamin B_1 deficient rats is diminished by the presence of salicyl. The dismutation of hexose diphosphate and pyruvate is not affected. The antifermentative powers of salicyl compounds have been known for 70 years. Salicylate ion is a bacterial inhibitor: (i) Non-specifically, by virtue of its action as a protein denaturant; and (ii) Specifically by inhibition of certain enzyme systems.

The greatest diversity of opinion exists on the question of the effects of salicyl compounds on the *acid-base equilibrium* of the blood. Early workers in this field believed that the condition was akin to diabetic coma because of the hyperpnœa and acetonuria. Other workers have reported acetonuria, reduced alkali reserve and decreased CO_2 content. Johnson working on cats, found a significant decrease in the alkali reserve and an increase in blood lactate, following dosage comparable to clinical doses of salicylate. He considers this to be evidence of a fixed acid acidosis. On the other hand, Scott *et al.* found no appreciable alteration

in the true reaction or the alkali reserve, even after large doses. Other workers find that there is depression of the arterial CO_2 content, and displacement of the reaction of the blood toward alkalinity, following doses up to 6 gm. of sodium salicylate. They ascribe this to central stimulation of respiration, and point out that with the highest doses dyspnœic states can arise. There is compensatory excretion of base in the urine.

Barnett *et al.* found a serum pH of 7.4 with CO_2 content of 25 volumes %, which suggests gaseous (*i.e.*, CO_2-deficit type) alkalosis. The hypernœa occurs long before there is any significant fall in blood CO_2 content. Dodd *et al.* report a human case with uncompensated fixed acid type of acidosis, with decreased CO_2 content and lowered pH. However, in experiments on dogs, the same workers found increased pH, with no marked disturbance in acid-base equilibrium in some, but in other experiments they found increased pH due to CO_2 loss from hyperpnœa, followed by compensatory loss of base, as evidenced by decreased alkali reserve of the blood and secretion of alkaline urine. Thus it appears fairly well established that hyperpnœa results from stimulation of the respiratory centre by salicylates, and not from acidosis. The ketonuria or ketonæmia may be due to either of two causes: (i) starvation resulting from anorexia and vomiting; (ii) some toxic effect on cellular metabolism.

The *basal metabolism* in febrile and afebrile subjects is increased by salicyl. Dodd *et al.* note that not only is the body temperature elevated by ingestion of therapeutic doses, but at any given level of temperature artificially induced, the basal metabolic rate is 20 to 25% higher after ingestion of the drug than before. Sylla reported a basal metabolic rate of +33% on the third day following a massive overdose, returning to normal when the next estimation was made on the ninth day.

Aphonia, which is reported in this paper, may be due to: (i) central effects; (ii) laryngitis secondary to the hyperpnœa; (iii) toxic or allergic effect (*i.e.*, œdema glottidis); (iv) inflammatory laryngitis, not related to salicylate therapy.

Hypocoagulability of the blood is produced by salicyl. Three groups of workers, headed by Shapiro, Link, and Meyer, have shown that oral doses of salicyl can cause hypoprothrombinæmia in man and experimental animals. It is theoretically possible that the not unusual hæmorrhagic manifestations of acute rheumatic fever may in some cases, at least in part, be due to massive dosage with salicylate. If liver function is adequate the hypoprothrombinæmia can be prevented by oral administration of vitamin K. Cirrhosis of the liver and pre-existing hypoprothrombinæmia augment the effect of salicylate. In this connection the latter authors consider aspirin to be more potent than sodium salicylate. The action is similar to but not as intense as that of dicumarol. One case is reported in which vitamin K gave only partial protection, and normal function was restored only after administration of ascorbic acid in doses of 400 mgm. daily. The prothrombin time returned to an abnormal value soon after ascorbic acid was withdrawn. Mills *et al.* report that animals adapted to tropical heat are prone to develop severe manifestations of vitamin K deficiency and require higher vitamin K content in their food than those kept in a cool atmosphere. Preliminary surveys of hospital statistics on hæmorrhagic disease of the newborn show that this type of human avitaminosis K is four times more prevalent among infants born in Gulf State hospitals than among the northern born. This may be related to the seasonal variation in hæmorrhagic tendency noted in our group of rheumatic patients.

The question of *administration of alkali* with therapeutic doses, or as a therapeutic measure in cases of overdose has not yet been decided. The finding of a gaseous alkalosis supports the contention that alkali will not help and may indeed by dangerous. On the other hand, ketosis is frequently present, as already noted, and on theoretical grounds alkali would seem useful in the control of this stage. Schnedorf *et al.* find that acetylsalicylic acid increases total titratable acidity and causes gastric retention; sodium bicarbonate diminishes both effects. This is a strong support for the latter's continued use. In the series reported in this paper, no harmful effects occurred which could be attributed to the alkali.

The symptoms of *methyl salicylate intoxication* differ from those of the other salicylates only in degree. Marked ketosis is present in most cases. Some of the toxicity appears to be due to the absorption of the unchanged ester.

ALLERGIC MANIFESTATIONS

Quincke states that urticaria occurs in cases of sensitivity or overdose. Balazs states that anaphylactoid phenomena are not demonstrable. Other manifestations of hypersensitivity reported are asthma, constriction and œdema of the pharynx, œdema glottidis, dysphagia, angioneurotic swelling of the face and purpura. Prickman and Buchstein reviewed 62 cases of hypersensitivity. The outstanding characteristic was the finding of allergic disorders in the personal or family history: 75% of the patients were asthmatic. In addition, asthma was the most common manifestation of hypersensitivity, occurring in 42 patients. The asthma in such patients is described as "severe and prolonged"; oxygen or helium-oxygen is frequently required. Four deaths resulting from such attacks have been reported. There is a high incidence of nasal polyps among patients who are found to be hypersensitive to aspirin, and those who had polyps had the most severe reactions. They caution against giving aspirin to patients with such polyps. They note that acetylsalicylic acid is frequently found to be an atopen, and believe that the acetyl group is associated with this great frequency.

Gardner and Blanton take a less lugubrious view of the matter. They administered 0.33 gm. of aspirin to 103 consecutive patients in an allergy clinic who gave no history of sensitivity to the drug. Fourteen of these said the medicine made them feel better; two asthmatics complained of a tight feeling in the chest. They obtained data from 22 allergists, covering 90,000 patients, in which 170 cases of aspirin hypersensitivity were reported, or an incidence of 0.2% among allergic patients. As a result they disagree with the contention that aspirin ranks first among allergy-producing chemicals. They state this should relieve the apprehension so many physicians feel toward the use of aspirin in allergic patients, though no less caution should be exercised in its administration.

PATHOLOGY

Pathological findings in fatal human cases and in experimentally poisoned rabbits examined in the acute stage include engorgement of the blood vessels and small hæmorrhages in most organs, and cloudy swelling of heart, liver and kidneys, which occasionally goes on to fatty degeneration. The administration of glucose to experimental animals lessens the intensity of the degenerative reaction, and delays death. Other workers find punctate hæmorrhages on all serous surfaces and occasionally also in the gastric and duodenal mucosa of fatal human cases. Quincke also found congestion with poor aeration of both lung bases, and serous pericardial effusion.

SUMMARY

It is evident from the conflicting views that are expressed that the problem requires considerably more investigation, more carefully controlled than many of the studies which are available at present.

The question of dosage is discussed, and evidence offered in support of the view that massive dosage is safe and feasible, when equal amounts of sodium bicarbonate are administered concurrently. No signs of renal abnormality were found in the series reported.

The pharmacology of salicylates is discussed, in particular the question of hyperpnœa and alterations in the acid-base equilibrium. Central stimulation of respiration resulting in a CO_2-deficit alkalosis, with compensatory excretion of alkali in the urine appears most compatible with the available results. The use of salicyl in allergic patients is discussed.

The administration of glucose appears to have a beneficial effect.

I wish to thank Surgeon-Commander J. W. Macleod, R.C.N.V.R., for permission to report cases 5 and 6. I am indebted to Surgeon Lieutenant-Commander Alan Ross, R.C.N.V.R., and Surgeon Lieutenant-Commander John D. Keith, R.C.N.V.R., for much helpful advice and constant encouragement.

A good list of references may be obtained from the author.

People whose course of life has reached a crisis must confront their collective past as fully as a neurotic patient must unbury his personal life: long-forgotten traumas in history may have a disastrous effect upon millions who remain unaware of them. If we have not time to understand the past, we will not have the insight to control the future; for the past never leaves us, the future is already here.—Mumford.

A MÜLLERIAN DUCT CYST IN A MALE*

By Emerson Smith, M.D. and Alex. Strasberg, M.D.

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THERE is seldom any justification for presenting a single case just because a lesion is rare. But when such a case creates a problem in differential diagnosis, then on clinical grounds it warrants reporting. Müllerian duct cysts are extremely rare. There have been eight recorded in the literature. In a broad sense these cysts should be categorized as pelvic tumours in the male, and as such, would be included among the reported cysts of the prostate, ejaculatory duct, and seminal vesicle. The evidence of embryology, however, points to the congenital origin of Müllerian duct cysts, whereas nearly all the other cysts have a mechanical obstructive factor in their etiology.

Developmentally, the urinary and genital systems are closely related. Embryos of six weeks still possess both male and female ducts, and when sex direction is determined, the ducts of the contrary sex atrophy. The Müllerian ducts in the female end by forming the tubes, uterus, and vagina. Normally these structures disappear in the male, and the only remnants left are the appendix testis and the prostatic utricle. If this duct persisted in the adult it would follow very closely the course of the vas and epididymis, and end in the utricle by passing through the prostate.

CASE REPORT

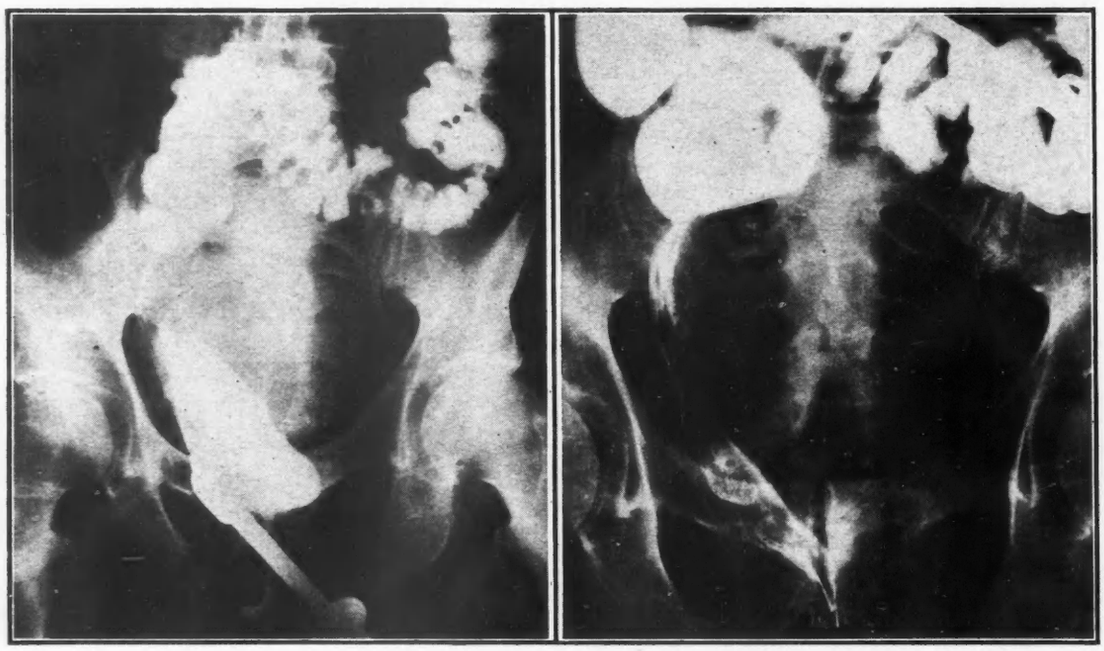
J.D., male, aged 72 years. Admitted May 6, 1943.

Complaints.—Frequency and dribbling of urination. Weakness of stream for last two to three years. Difficulty in starting stream.

Patient has been catheterizing himself for the past 6 months. Physical examination essentially negative. Blood pressure 186/118.

Genito-urinary system.—Prostate markedly enlarged, not fixed, not nodular, not tender. Upper edge inaccessible to finger. Residual urine 180 c.c.

Laboratory findings.—Urine: yellow hazy, albumin +, sugar none. White blood cells rare; red blood cells scattered. Rare hyaline cast. Epith. Phenosulphonphthalein output: 1st hour 25%; 2nd hour 25%; total 50%.



Cystogram.—Small bladder of very irregular outline, with small multiple diverticula.

Barium enema.—Upon injection of barium the rectum and sigmoid were definitely narrowed with a constricted area at the rectosigmoid junction. After evacuation the narrow area still remains.

Fluoroscopic. — A persistent soft tissue mass apparently filling the major portion of the pelvis, with the rectum and sigmoid markedly displaced to right.

Barium enema and cystogram.—Definite pressure on the rectum displacing it markedly to the right. The bladder does not appear to be causing this pressure as it lies anteriorly to it. The mass certainly does not arise from the rectum itself, but is definitely pressing on it and displacing it. Apparently the rectosigmoid area is adherent to the mass in the pelvis.

Operation.—May 14, 1943. Suprapubic cystotomy for prostatism and subtrigonal cyst. On opening the bladder a large smooth cyst-like swelling pressing whole base of bladder forward was found. Dark brown fluid was aspirated. Mass was found to be a loculated cyst with necrotic appearing walls. It was widely opened

* Read at the Annual Meeting of the Canadian Medical Association, Section of Urology, Toronto, May 22, 1944.

and a running hæmostatic suture to edges was placed providing free drainage. Vesical neck somewhat tight. No prostatic intrusion.

Fluid microscopically.—Red blood cells many; white blood cells few. Numerous rods and cocci. No spermatozoa.

Culture heavy growth of anaerobic Gram-positive rods of the genus Clostridium (type not identified). This cyst filled up again on June 11. It was again aspirated and 300 c.c. greenish brown sterile fluid obtained.

Patient was discharged on July 2, 1943, with a permanent suprapubic tube.

Diagnosis.—Subtrigonal cyst (Müllerian).

Patient was re-admitted on November 29, 1943.

Until two weeks previous to this admission the suprapubic tube was draining well. Since then the subtrigonal cyst had re-filled to such an extent as to completely obliterate the cavity of the bladder, rendering the retention of the tube impossible. There was no alternative but an attempt at radical excision of the cyst. His physical condition had improved since last admission. On December 3, he was transferred to the service of Dr. Gavin Miller, who performed the following operation.

"A left paramedian incision was made extending from above the umbilicus down to pubis. Large cyst filled the pelvis. It was freed posteriorly after cutting the peritoneal attachment, and on coming towards the left side while freeing the cyst from the rectum, the cyst was opened. A great deal of chocolate-coloured contents with fibrin and what appeared to be necrotic material came out of this cyst. This was removed by suction, and the pelvis cleared of this material so that dissection could be continued. An incision was then made over the surface of the cyst through the peritoneum, and the true lining of the cyst dissected free from this down to the bladder. Here it was firmly fixed to the bladder where it had been previously marsupialized into the bladder. The cyst was freed on all sides to the point where it was fixed to the bladder, and this was then cut through with scissors. It would appear that the whole cyst was removed, though naturally it was difficult to state this with assurance, as the work was done deep down in the pelvis, right down to the trigone of the bladder where it was closely attached. On excising the tumour, no opening apparently was made into the posterior wall of the bladder. The bladder contained a catheter through a suprapubic cystotomy, and this wound was enlarged to give adequate drainage to the bladder. Bleeding points were ligated, and the pelvis floor was then reconstructed by suturing the peritoneum together. The wound was closed in layers using catgut. A cigarette drain was passed down into the retrovesical fossa."

Pathological examination.—Specimen consists of a thin-walled sac with shaggy external and internal surfaces. It has been opened and measures 19 x 6½ cm. The wall is 0.4 to 109 cm. in thickness.

Microscopic examination.—Sections show the cyst wall to consist of varying amounts of smooth muscle and collagenous connective tissue. There is no epithelial lining. The layers nearest the lumen of the cyst contain moderate amounts of coarse brownish pigment granules which show positive reaction for iron, and do not lie within cells. There is no evidence of malignancy.

On the fourth postoperative day, patient developed bronchopneumonia, from which he succumbed on December 11. Autopsy was not granted.

DISCUSSION

The clinical picture is usually that of bladder obstruction; the mechanism here is external and results from increasing pressure of the subvesical cyst on the bladder. The symptoms may range from slight frequency, dysuria, urgency, to acute retention. Rectal palpation may reveal a huge tense mass which may readily be mistaken for an enlarged prostate, which was our experience here. A cystogram will however fail to reveal any evidence of prostatism, and perhaps show a deviation of the bladder from the midline. In addition a barium enema will exhibit filling defect of the colon from external pressure. It must also be differentiated from cysts of the seminal vesicle and ejaculatory duct. The finding of spermatozoa in the aspirated fluid is diagnostic of these. An intravenous pyelogram will differentiate it from a cystic swelling of a double ureter, one of which is occluded. A cystoscopy will usually reveal two orifices on the same side.

The ideal treatment is complete excision of the cyst. This is extremely difficult because of the incorporation of the cyst in the bladder wall, and the origin of the pedicle in the sinus pocularis of the prostate. However, with careful dissection one can separate the cyst from the bladder and fulgurate the remnant of the pedicle.

There is no recurrence of this type of cyst reported, following this treatment.

Less drastic measures are repeated aspirations of the cyst per rectum, or marsupialization of the cyst into the bladder by a suprapubic cystotomy.

SUMMARY

A case of Müllerian duct cyst in a male is reported. It simulates prostatism and must be differentiated from it. Treatment must aim at its complete excision.

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A reassuring statement on the health of the nation (Great Britain) has been made by Sir Wilson Jameson, chief medical officer, Ministry of Health. He has stated that the birth rate continues to rise, and the infant mortality rate remains low. There is an increase in short-term illness—probably only to be expected—but there is no increase in serious long-term illness, and there is now less serious infection in the country than at the outbreak of war. Summing up the position, Sir Wilson Jameson considers that so far as health is concerned we are entering the fifth year of war in extraordinary good condition.—*J. Roy. Inst. Pub. Health & Hyg.*

SEQUELÆ FOLLOWING SPINAL ANÆSTHETIC*

By D. C. Aikenhead, M.D.

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MANY people believe that spinal tap is the master word in spinal anæsthetic. Once that clear fluid drips from the needle many surgeons say to the patient "Relax now, your operation is over" in the manner that Mephisto tells the young men "enjoy life while you can". Would that these surgical *bon mots* were true!

Sequela is defined as a "morbid affection following a disease". If we follow the definition literally, sequela would follow spinal anæsthetics in the presence of some disease of the cord existing before the operation. The popular impression is that spinal anæsthetic influences the nerve cells of the spinal cord in certain people without previously existing neurological trouble.

The following sequelæ are taken from medical literature following spinal anæsthesia. Those sequelæ with an † are personally known to me in this Province. †Headache; aseptic meningitis; sixth cranial nerve paralysis; paralysis of cranial nerves 5, 7, 8, 12; †lesions of cauda equina and conus medullaris; radiculomyelitis; sacral radiculitis; focal cerebral symptoms; hæmorrhage; infection; †pain in the back.

How often does a neurological complication occur following a spinal anæsthetic? Hyslop mentions 0.05% of sequelæ and Jarman gives 0.001% in frequency of paralysis. The latter does not mean complete muscular paralysis.

In reviewing the literature upon the subject in question, one notes first that patients who have had a sequela from a spinal anæsthetic had, as a rule, a mixed drug injected into the subarachnoid space. This drug had anæsthetic properties plus other substances to prolong its effect upon the cells of the spinal cord and influence the specific gravity of the cerebrospinal fluid. Amongst the agents mentioned are, spinocain, durocain, stovain and apothesine. Second, the literature is in accord with the careful selection of patients who are to have subarachnoid block for their surgery. Patients suffering from pernicious anæmia, multiple sclerosis, tabes or general paresis should not have a spinal anæsthetic in any form. I will not argue the point that the muscular relaxation under spinal anæsthesia allows the surgeon to do better surgery more easily, and in certain lesions of the common bile duct the surgeon may find calculi that would not be found under other anæsthetic agents. Keeping this in mind, it would seem that the risk of complications was greater following spinal anæsthesia upon an organic lesion of cerebrospinal nervous system than the advantage to the surgeon in muscular relaxation.

What of the patient with a latent morbid process of the cerebrospinal nervous system that has no subjective or objective signs of this condition? After taking a full history and a careful examination of the patient it is decided to use spinal anæsthesia for the operation. One finds many days later that a latent brain tumour has been activated by this type of anæsthetic. One can comfort himself with the thought that reasonable means had been used to guard against such a possibility.

The most serious feature in this problem is that no steps can yet be taken to avoid these serious sequelæ, for we are ignorant of their causation. It would seem a suitable subject for discussion by surgeons, neurologists, pathologists and anæsthetists.

Critchley, who states the problem most clearly and in the fewest words, says:

> "Are some of these sequelæ attributable to faulty technique? to lack of skill in performing the actual puncture of the theca? to errors in dosage? to unsuitable pre- or post-anæsthetic medication or nursing? How far is the drop in blood pressure a factor by producing changes in the cerebrospinal blood circulation? What part is played by the anæsthetic substance itself and are nervous sequelæ commoner with one preparation than another? Can it be said that some or all of these nervous sequelæ are due merely to the activation of a latent morbid process within the nervous system itself by the spinal puncture of the anæsthetic agent?"

Lindemulder mentions two deaths following spinal anæsthetic. Both patients were advanced in years; the operation was suprapubic prostatectomy. He says in part:

> It has been said by several observers that there is no irritation of the nervous system following an injection of procaine and its allied drugs and they compare this finding with irritation produced by the inhalation method on the mucous membrane of the bronchi and lungs. However, I find there is a definite toxic effect on the spinal cord and the spinal nerve roots which shows its effect clinically and pathologically, the patients usually complaining of pain, and this finding can be explained by the pathological study of nerve roots."

Brock mentions seven neurological complications following spinal anæsthetic amongst

* Read at the Seventy-fifth Annual Meeting of the Canadian Medical Association, Section of Anæsthesia, Toronto, Ontario, May 25, 1944.

many hundreds of operations performed under spinal anæsthesia without any sequelæ. He recommends that spinal anæsthesia be restricted to a special group of individuals unable to withstand the risks of a general anæsthetic agent. Hammes, who gives an excellent bibliography upon the subject, mentions eight cases of neurological complications following spinal anæsthetic. Of these eight cases, five patients had organic neurological disorders preoperatively which were aggravated by spinal anæsthesia and surgery. Three patients did not manifest any sign of nervous disorder before operation. The author sums up his article with the following conclusion — "Serious complications in individuals normally neurologically normal are relatively infrequent and in properly selected cases spinal anæsthetic holds an important place in the anæsthetist's armamentarium".

Let us review the sequelæ as outlined in the beginning of this article:

Headache.—This is not a serious factor in spinal anæsthesia today. First one must avoid spinal anæsthesia in patients who are subject to violent headache, migraine, etc. What part does the leakage of cerebrospinal fluid into the extradural space contribute to post-spinal tap headache? Much has been written to prove that the spinal tap has nothing to do with headache and that the dural puncture is the whole factor in postoperative spinal headache. McPherson who has done many hundred spinal taps for the injection of lipiodol for the diagnosis of intraspinous lesions states that post-spinal tap headaches are purely due to leakage of cerebrospinal fluid. He does the tap under fluoroscopic vision with No. 14 or 15 needle. Using this technique with a sharp needle and a clean puncture of the dura, he finds little after trouble with headache. He mentions that where the spinal tap is difficult, possibly the dura has been entered more than once before cerebrospinal fluid flows, that after the injection of lipiodol the latter streams out of the dura through the holes made by the needle. From personal experience I am inclined to agree with Dr. McPherson that in selected cases with modern technique cephalgia is not a serious worry. I might add that the rare postoperative spinal headache does occur without any known cause, is most distressing and is slow to disappear. Individuals who are fond of reading seem more prone to headaches. If your patient is an avid reader and has a simple appendectomy, choose some other agent rather than subarachnoid block for his surgery.

We have used continuous spinal for some time in surgery, the incidence of headache following operations with continuous spinal is no higher than operations following a single tap. It has been said that any time continuous spinal is used for an operation the operation is a long and heavy one. The patient has so much other distress that a headache may be overlooked. We have found headaches more frequent following minor operations under spinal anæsthesia.

Aseptic meningitis.—Headache, cervical rigidity with an increase in the cerebrospinal fluid pressure. This condition causes considerable worry for from 3 to 7 days but there is no record of any permanent neurological changes.

Paralysis of cranial nerves.—Hayman mentions paralysis of the sixth cranial nerve for some months with eventual recovery. This nerve is not a robust structure, it passes from under the lower border of the pons as it emerges from the brain to occupy the inner wall of the cavernous sinus, then continues through the sphenoidal fissure to supply the two heads of the external rectus muscle. During its course the nerve would be subject to any disturbance of cerebral dynamics. The paralysis of other cranial nerves must be rare.

Disturbance of bladder control.—I have followed appendectomies, herniotomies, and hæmorrhoidectomies under inhalation and spinal anæsthesia and could never persuade myself that the incidence of catheterization post-operatively was higher with spinal anæsthetic than inhalation. We had three patients who had repairs of inguinal hernia under spinal anæsthesia. These three patients had interference with bladder control and residual urine. Neither condition was cleared up upon leaving hospital. Fortunately, all three patients improved with time and at the end of four months following the operation control and residual were normal. We introduced a different agent to produce spinal anæsthesia at this time, all three cases being noted in a three-month period. We are using this agent daily but use more dilution with cerebrospinal fluid than formerly.

An obese male, aged 55, had an inguinal hernia, a septic chest and a history of coronary infarction two years previously. Spinal anæsthesia was chosen and the operative course was even, with some drop in blood pressure. He was returned to the ward with an order for an intravenous infusion at once. Due to a misunderstanding, this was delayed, he developed another coronary block and died three days later.

A physician chose a spinal anæsthetic for excision of his hæmorrhoids. The operation went along smoothly, and postoperative course was uneventful. One month later this doctor became confused and unable to continue practice. A spinal tap showed clear spinal fluid with no cells but under high pressure. Some ten days later under avertin anæsthesia a large inoperable astrocytoma upon the right cerebral hemisphere was exposed. This tumour was at least six months old. Would the patient have shown symptoms of brain tumour at this time without having had a spinal anæsthetic? Was the operation under spinal anæsthesia coincident with the time symptoms would have normally appeared from the brain lesion? Did the spinal tap upset the delicate fluid balance between the spinal cord and the cranial cavity? Did the anæsthetic agent (80 mgm. of novocain) activate the latent brain tumour? Was it a combination of the spinal tap and novocain? Whatever may be the explanation, I know of three instances where a latent brain tumour was brought to operation following operation under spinal anæsthesia.

Infection.—We have never had an infection of the soft tissue or subarachnoid space amongst some 8,000 spinal anæsthetics. This statement is made in all humility as it is realized that one might get a subarachnoid infection even with apparently correct technique. It would appear that infection is not a frequent sequela of spinal anæsthesia.

A male, aged 55 years, whose physical condition would correspond to his stated age had a double herniotomy under spinal anæsthesia. The course of the operation was uneventful. That evening the patient complained that he was unable to move his legs. I saw him the next morning. He was unable to move his legs but he could resist passive movement of his limbs. In other words, the legs were spastic. There was no loss of sensation. The patient was greatly worried over his condition and was pessimistic over the possibility of movement returning to his limbs. Without any physiological basis, I felt that this condition would eventually right itself and was cheered by a senior nurse in charge of the flat who said that, "he would get better much faster if the doctors wouldn't pay so much attention to him". This condition cleared up within ten days and the patient left the hospital without complaint.

Pain in the back and legs.—This condition may follow operations performed under inhalational anæsthesia. Faulty position on the operating table or lack of support of the dorso-lumbar curve during the period of the operation can cause postoperative pain in the back and extremities. It is a good rule to follow that patients with "sore backs" (what a headache "sore backs" are to men in active practice!) that is more or less discomfort in the dorso-lumbar area be given some other agent than spinal anæsthetic for their surgery.

A patient for hæmorrhoidectomy received 100 mgm. of novocain dissolved in 2 c.c. of cerebro-spinal fluid. This anæsthetic was a failure. It was found later that most of the crystals of novocain were in the top of the ampoule which was discarded when it was broken off. The operation was completed under inhalation anæsthesia. The patient complained of pain in the back and legs for at least six months following the operation.

In a city the size of Winnipeg, over a period of years one meets patients frequently who have had various anæsthetic agents during the said period. It would seem to follow that certain patients who had spinal anæsthesia for abdominal surgery mention that since their operation they have had disturbances in sensation in their lower extremities. Upon interrogation, these disturbances in sensation are not permanent or continuous. They have a feeling that at certain times locomotion is not as easy as before operation.

I would like to mention two cases briefly where delay in operation aided our mortality statistics. The first was a male around 30 years in apparent good health. He was to have a hæmorrhoidectomy under spinal anæsthesia. The morning the operation was scheduled the patient had a headache. The temperature, pulse and respiration were within normal limits. As this was an elective operation, it was decided to postpone the surgery until the next day. The headache proved to be a prodromal symptom of encephalitis. Despite all medication, the pa-

tient died within a week. It would have been so easy to ignore the headache and complete the operation.

The second case was an elderly man with intestinal obstruction. I prefer spinal anæsthetic for operation in intestinal obstruction, providing the condition of the patient is satisfactory. In this particular patient (it occurred many years ago) the site of the obstruction was vague. The surgeon wished spinal anæsthetic to provide good muscular relaxation to aid in finding the cause of the obstruction. The patient's mental state was not bright but he could give an intelligent reply to questions. While we were waiting for some laboratory work in connection with some blood grouping the patient suddenly became cyanosed and died in a few minutes. No medication of any kind had been given. Ever so small a dose of intraspinal anæsthetic agent during the period of waiting for the blood matching would have produced a fatality that would have been charged to spinal anæsthesia.

Paralysis of the rectum and bladder.—This condition has been recorded in literature but, fortunately, is extremely rare. I know of a patient who lost the use of sphincters permanently following the use of a compound drug to produce spinal anæsthesia.

Sacral radiculitis and radiculitis.—This condition may be mentioned with partial loss of bladder control, pain in the legs and "sore back". As mentioned previously, I have never seen one of these conditions that did not clear up in time. The literature gives a number of disturbances of urinary control and sacral anæsthesia.

Experimentally, one can produce permanent lesions in animals by the subarachnoid injection of drugs used to produce spinal anæsthesia in surgery. Unfortunately, the dose of the drug used in animals is relatively large. If we used a weight comparison, a ten-pound animal would receive one-twelfth the amount of spinal anæsthetic that a 120-pound human being would receive for a surgical operation. We find that animals receive amounts of drug intraspinally that would be equivalent to humans receiving 1,200 to 1,600 mgm. of novocain by the subarachnoid route. I can find no record of animals receiving subarachnoid anæsthesia with the same ratio of drug used according to weight as in surgical practice.

We do some three hundred transurethral prostatic resections yearly. The average age of these patients would be close to 70 years. Many of these men are in poor physical shape. Many have arthritis. A number have difficulty in walking. We find it difficult to get some into the lithotomy position ready for the transurethral resection on account of stiff hips or legs. We have no record that difficulty in locomotion or stiffness has been increased by the use of spinal anæsthetic.

Hæmorrhage.—Anyone who does considerable spinal anæsthesia will get a "bloody tap" occasionally, which looks disconcerting but does not apparently cause after trouble. I have given a small number of spinal anæsthetics for prolapsed intervertebral discs. When the surgeon makes his incision through the tract of the spinal needle one is surprised to find the amount of extravasation in the tissues even with a small sharp needle.

Focal cerebral symptoms.—Critchley mentions this condition in a 68-year female diabetic. I have given a number of spinal anæsthetics following a subarachnoid hæmorrhage; the latter condition was at least six months past. There is no evidence that the spinal anæsthetic changed the condition.

CONCLUSIONS

Sequelæ would seem to be avoided by:

1. Careful selection of patients who are to have operation under spinal anæsthesia, eliminating the patients with pernicious anæmia, hæmoglobin under 60%, any organic cerebrospinal condition, migraine, "chronic sore back".

2. Statistically, the use of novocain or procain has less recorded complications than drugs that have a longer anæsthetic action.

3. Avoid the flippant use of "Spinal! There's nothing to it". Choose a spinal anæsthetic where it is necessary but make no prophecy as to the outcome.

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THE RÔLE OF HÆMORRHAGE IN MORTALITY RATES IN PREGNANCY AND CHILDBIRTH

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MATERNAL mortality rates must be of some interest to the great majority of medical practitioners. That on this continent women should die each year in their thousands because they were pregnant, is a doleful commentary on modern medicine. True, many are a party to their own deaths through irregular or criminal interventions. Yet about as many die because, as a profession, we either do not or cannot cope with a critical situation. Man is prone to errors in judgment and always will be. The man who makes no medical mistakes is the man with no practice.

It was thought that the maternal mortality figures in a large open hospital should prove of some interest. Our own interest was whetted by the growing belief that the chief cause of maternal mortality (especially in the late months of pregnancy) is no longer infection, but hæmorrhage.

Our maternal statistics show a generally decreased maternal mortality, especially during the past ten years. However, a break-down of the figures into the usual classifications points out that the improvement is as follows: (1) infection, decided improvement; (2) toxæmia, minor improvement; (3) hæmorrhage, little if any improvement.

Infection still leads the way, but its leadership is being challenged, and if trends are any indication, we can expect soon to place the dubious mantle of leadership on a new champion—hæmorrhage.

There can be no doubt concerning the splendid improvement in national mortality figures from infection. Hospitals, equipment, technique, together with powerful bactericidal agents recently introduced, have all played their parts. Add to these a better appreciation of intravenous therapy, be it blood, plasma, serum, saline or glucose, and we realize some of the reasons for the marked decline in maternal mortality from infection.

Toxæmia, the second largest cause of maternal deaths in our national figures, is also on the decline. If our knowledge of its etiology remains nil, nevertheless increased ante-partum care and observation, increased education of the public to the dangers that may beset the seemingly normal phenomenon of pregnancy, especially during the last trimester, a better knowledge of the rôle that diet may play, a more thorough appreciation of the benefits of sedation and intravenous therapy and finally the use of early intervention either by induction of labour or occasionally Cæsarean section, all have played a part in the decline of maternal mortality figures from toxæmia.

In an attempt to substantiate our suspicions, we present a detailed study of the deaths in pregnancy and childbirth as they occurred in, (1) the Province; (2) the City of Vancouver; and (3) the Vancouver General Hospital, during the years 1941 to 1943.

Secondly, we divided the cases into broad age groups as follows: (1) maternal deaths before viability; (2) maternal deaths after viability; (3) maternal deaths in extrauterine gestation.

Table I shows the activity of our own hospital in this field. Our experience perhaps differs very little from any other cross-section of the country. It should be stated again that this is an open hospital. More than 200 doctors took part in the formation of these figures.

TABLE I.

DEATHS IN PREGNANCY AND CHILDBIRTH—VANCOUVER GENERAL HOSPITAL, 1941-1943

	1941		*1942*		*1943*	
Type	*No. cases*	*Deaths*	*No. cases*	*Deaths*	*No. cases*	*Deaths*
Pregnancy intrauterine (Before viability).....	407	0	512	3	573	4
Pregnancy intrauterine (Beyond viability)...	2,787	2	3,433	8	3,656	3
Pregnancy extrauterine.	35	0	18	0	25	1
Total.....	3,229	2	3,963	11	4,254	8

It is apparent that in the past three years there were admitted to the wards of this hospital 1,492 cases of abortion with seven deaths, 9,876 viable pregnancies with 13 deaths, and 78 ectopic pregnancies with one death. There was then a total of 11,446 pregnancy cases admitted to our wards in the past three years with 21

deaths; of the seven abortion deaths, 5 died from infection, 2 from hæmorrhage; of the 13 deaths with viable pregnancies, 5 died from hæmorrhage, 7 from other causes (myocardial disease 2, bacterial endocarditis 1, tuberculous meningitis 1, pulmonary emboli 2, shock without demonstrable hæmorrhage 1). One case died suddenly 48 hours after delivery by elective Cæsarean section with sterilization. There were no deaths that could in any way be classed as puerperal sepsis.

The ectopic death was a case admitted in profound shock, with no history. She died one hour after admission. Autopsy findings were ruptured tubal pregnancy with massive hæmorrhage.

It is apparent in our experience during the past three years that the chief cause of maternal deaths before viability is infection, but the chief entity in maternal deaths after viability (28 weeks) is hæmorrhage.

Just why hæmorrhage should continue the *bête noire* of obstetrics is worthy of our serious consideration. In this analysis, hæmorrhage is used despite the fact that shock is the vital factor. However, in our cases, hæmorrhage was very apparently the cause of the shock. Other factors may cause shock.

Table II affords a comparison of hospital, city and Provincial figures. They will be of minor interest to any but British Columbia people.

As may be noted from the Provincial statistics presented, toxæmia, or at least death from toxæmia, is much more common outside the City of Vancouver. It is reasonable to understand that these fatalities come from rural areas where patients cannot be watched so closely nor given the same ante-partum care. Moreover, the hospital treatment these people so sorely need is denied patients in outlying districts.

Our toxæmia records in this hospital have been compiled elsewhere, together with a broad method of treatment as laid down by the attending staff, as a guide to any who may wish to use it. We think it has served a purpose.

A discussion of our toxæmia records and standard treatment will be published at a later date.

Table III divides the maternal deaths into the time-honoured classifications: (1) infection; (2) toxæmia; (3) hæmorrhage; (4) other causes.

We had access to case histories only in our hospital cases, but I know that Provincial and city statisticians made a fair and impartial

TABLE II.

DEATHS IN PREGNANCY AND CHILDBIRTH—1941-1943

	Vancouver General Hospital			*City of Vancouver*			*Province of British Columbia*		
Type	*1941*	*1942*	*1943*	*1941*	*1942*	*1943*	*1941*	*1942*	*1943*
Pregnancy intrauterine (Before viability)...	0	3	4	3	4	6	10	16	11
Pregnancy intrauterine (Beyond viability)..	2	8	3	3	13	4	28	25	27
Pregnancy extrauterine.....	0	0	1	0	0	1	2	2	2
Totals.....	2	11	8	6	17	11	40	43	40

TABLE III.

DEATHS IN PREGNANCY AND CHILDBIRTH—1941-1943

	Vancouver General Hospital				*City of Vancouver*				*Province of British Columbia*			
	1941	*1942*	*1943*	*Total*	*1941*	*1942*	*1943*	*Total*	*1941*	*1942*	*1943*	*Total*
Infection.....	0	3	3	6	3	3	4	10	15	6	7	28
Toxæmia.....	0	0	0	0	0	0	0	0	9	8	5	22
Hæmorrhage....	1	2	4	7	1	5	4	10	9	13	20	42
Others.....	1	6	1	8	2	9	3	14	7	16	8	31
Totals.....	2	11	8	21	6	17	11	34	40	43	40	123

classification of their figures. We appreciate their fair and wholehearted co-operation.

The 28 deaths from infection in the Province are nearly all in the non-viable group. The 42 deaths from hæmorrhage are nearly all in the viable group.

It is not suggested that shock always has its origin in hæmorrhage. We are cognizant of the recent work done on shock from the standpoint of increased permeability of the walls of the capillary bed with resultant loss of fluid and resulting hæmoconcentration. Those agents are probably many and varied, but in the field of obstetrics, hæmorrhage, exhaustion, dehydration, sweating, vomiting, prolonged anæsthesia, etc., are the contributing factors and the greatest single factor is hæmorrhage.

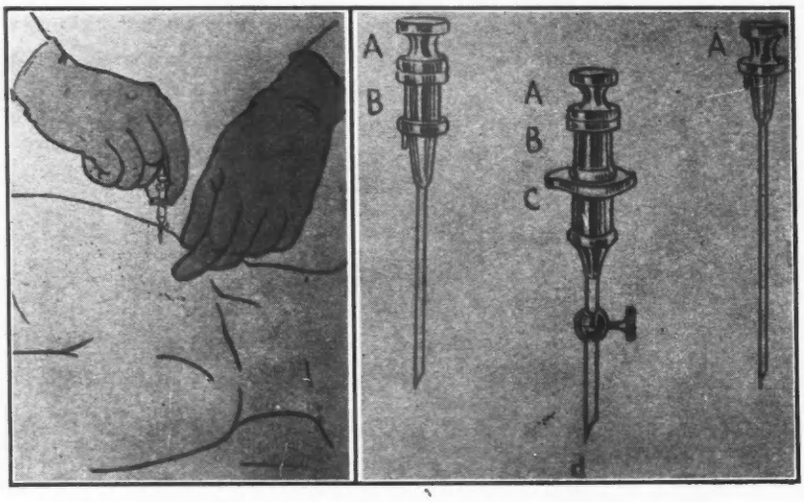

Fig. 1 Fig. 2

Fig. 1.—Sternal puncture. **Fig. 2.**—Sternal puncture needle. (A) Stylet. (A B) Stylet and inner needle. (A B C) Stylet, inner needle, outer needle with guard.

The reason for the constant and consistent inroads made in our maternal mortality rates by hæmorrhage, can only be conjectured, but attention might be drawn to one or two very human attributes.

As an obstetrical generation we are more impatient than the generation which preceded us. Youth is naturally impatient, but some of us do not improve much as we grow older. The consultant who is called in is expected to do something. In so many cases this is necessary of course. On the whole however, I believe that the soundest obstetrician is he who knows above all what not to do. Patience is an enormous and far-reaching virtue.

An important factor lies in failure to grasp the fact that the delivery of the placenta is not the completion of the procedure. Only when the maternal pulse is at 100 or less, and no sign of shock or hæmorrhage is present, can the obstetrician be sure his patient is safe.

Last year three women died in the Vancouver General Hospital at or about full term. One was a sudden collapse and death of an elective Cæsarean section 48 hours after operation. The other two demonstrate our point. Both were clinically normal individuals. Each was a multipara and each had been delivered of full-term babies without incident on former occasions. Both had moderately short labours this time, and neither required any instrumentation. In one case moderate, not excessive, bleeding went on for an hour after delivery of the child, but before the placenta was delivered. It was believed necessary to remove the placenta manually, and this was done. The placenta was believed to be retained, not adherent. Very soon after the patient went suddenly into profound shock. All attempts to enter the circulation intravenously failed. Cannulæ were placed in the veins, but fluids would not pass and could not be forced. The patient died five hours after delivery. The second case delivered both fetus and placenta readily. Some bleeding afterward was controlled, it was thought, with pituitrin and ergometrine. The pulse was fair, 136 to 118. The doctor left the hospital. One hour later the patient went into profound shock. The doctor could not be reached. Intravenous fluids failed as in the first case. Cannulæ were placed in the veins, but fluids could not be forced into the circulation.

The impression these two tragedies made on those who administer the affairs of the department can be imagined. I was present in an advisory capacity at both deaths, and it was felt that somehow both deaths were avoidable, even though we seemed powerless to avoid them. The terrible thing in both instances was our failure to introduce fluids into the circulatory system. It simply could not be done so far as we were concerned.

As a result two factors have been brought

into play in this hospital which we hope will help to avoid a recurrence.

First: a standing rule in the case room that any patient either before, during or after labour, whose pulse reaches 120 and whose doctor cannot be immediately reached, shall have an intravenous of 5% glucose in sterile water at once. The idea is to get into the circulation, get fluids started and kept up until the patient is out of danger.

Second: we have looked into the field of bone marrow infusions. A study of, I believe, nearly all the literature extant, has led us to believe that here is another procedure which is a very decided addition and aid in our fight against hæmorrhage and shock. Here is a procedure that permits easy and direct access to the circulation either through the sternum or the tibia. In adults the sternum is generally used. In infants and children the tibia is the usual medium. The technique has been described in detail by others, so there seems no need to repeat it. It is essential however, that a proper sternal puncture needle be used. We have used sternal puncture 10 times in the obstetrical department of this hospital, always in lieu of intravenous therapy, but purely in order that we can familiarize ourselves with the technique, and so be ready when the real need arises. We have given blood transfusions three times, glucose and saline four times, and plasma three times by this method.

There are one or two drawbacks in our limited experience. (1) The introduction of the needle is not without pain. The use of novocaine in skin and periosteum is a great comfort. (2) There is an initial feeling of pressure as the fluid begins to flow in. This disappears as the procedure progresses, but any attempts to force the fluid into the marrow is uncomfortable. (3) We have found it a slow procedure on one or two occasions, but with a new needle as modelled by Tocantins, fluids flow in quite satisfactorily.

We have now a sternal puncture set sterilized and ready at all times for instant use in our case rooms. We do not suggest that it will take the place of intravenous therapy—it never will; it does mean that never again will we be denied access to the circulation of a dying patient; and after our experience of last year, I know of no more comforting thought. We believe it should be added to the equipment of every case room in the land.

CONCLUSIONS

A study of maternal mortality in a limited number of cases in the past three years would suggest:

1. That the incidence of infection is less and is found chiefly among abortion cases.
2. That among deaths after viability the chief factor is hæmorrhage.
3. That the incidence of toxæmia deaths is markedly lowered in urban areas where hospitalization is readily accessible.
4. That with greater care and observation, at least some of our hæmorrhage fatalities might be avoided.
5. The need of early access to the circulation by intravenous therapy, at the first sign of approaching shock is vital.
6. Emphasis is placed on sternal puncture. This relatively simple procedure may well prove a life-saver in your case room.

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REPORT ON THE USE OF CONTINUOUS CAUDAL ANÆSTHESIA IN SIXTY-FIVE OBSTETRICAL CASES

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IN this report the writer gratefully acknowledges the most valuable work of Hingson and Edwards and others[1 to 8] who have been responsible for the development of standard techniques for the use of continuous caudal anæsthesia in obstetrics, and who have drawn attention to the value of this method in the relief of pain during labour. Since the anatomy and physiology of this form of regional anæsthesia have been adequately covered in these numerous previous reports, no attempt will be made in this paper to discuss these aspects of the subject. Our

efforts here will be directed to reporting an experience with continuous caudal anæsthesia in some 65 obstetrical cases during the period between March, 1943 and March, 1944. At the conclusion an attempt will be made to suggest a program of obstetrical anæsthesia to be used in certain selected cases based on our experience to date.

After a fairly extensive experience with various methods of obstetrical analgesia and anæsthesia, which included the use of narcotics and hypnotics in various combinations and doses, Gwathmey rectal ether, and the more commonly used forms of inhalation anæsthesia such as chloroform, ether, nitrous oxide and oxygen, and cyclopropane, one has not infrequently been concerned about the effects of some of these on the baby, particularly so in long and difficult labours. Cases were recalled where intense efforts at resuscitation were necessary for asphyxiated or apnœic babies. These efforts were, fortunately, usually successful. However, in a few cases the babies did not respond. In these fatal cases, when other factors could be ruled out as a cause of death, the tragic result could be more or less attributed directly to the method or methods used for the relief of pain in labour.

Quite naturally we often asked ourselves this question, "Are we justified in using any form of drug for the relief of pain in labour when its use carries such a risk for the baby?" Consequently, in more recent years, our use of these various drugs has become much more cautious and sparing. We turned to the use of very small doses of barbiturates during the early periods of the first stage, the very occasional use of morphine and scopolamine in certain selected cases, and the almost routine use of local infiltration anæsthesia of the perineum with 1% procaine for making episiotomies and repairing perineal damage occurring during the second stage. We have tried, during the past year, to avoid as often as possible any inhalation anæsthesia until the baby had been born. In this way we definitely reduced by a considerable amount the occurrence of asphyxia or apnœa following delivery. When the reports concerning continuous caudal anæsthesia made their appearance, we felt that here was a method of anæsthesia worthy of investigation, since it seemed to offer relief of pain during labour without too much risk of respiratory embarrassment in the newborn. As a result, we began in March, 1943, to use the method in some of our cases.

During the period of approximately one year from March, 1943 to March, 1944, we have used continuous caudal anæsthesia in 65 cases. We have not been able to use it in consecutive cases unfortunately, since the volume of work at certain times made it impossible to devote the time necessary for this method. Other factors such as multiparity where labour was advancing too rapidly also prevented us from using it as often as we might have done, if we had been able to devote our full time to the problem. However, we made an effort to try the method in as many cases as possible in order to evaluate its relative effectiveness. No effort was made to select these cases other than to exclude cases with definite dystocia, infection and breech presentations. The latter were excluded, since our management of breech labours requires the considerable use of the secondary powers, and to date we have been reluctant to use the method in most breech cases, more particularly the primigravid frank breech.

The apparatus and technique used in these cases were those described by Hingson and Edwards. The drugs used were, procaine 1.0% solution in 11 cases, metycaine 1.5% solution in 42 cases, and pontocaine 0.25% solution in 9 cases. In 3 of the 65 cases the procedure was used for Cæsarean section. Excellent results were obtained in 50 cases, fair results in 8 cases, and poor results or complete failure in 7 cases. Our criteria for an excellent result were complete regional anæsthesia with relief from labour pains, without unusual side reactions, coupled with continued normal progress in labour. We considered as fair or not completely satisfactory those cases in which there was incomplete anæsthesia, unusual side reactions such as excessive vomiting during labour, or other complications such as infections, or undue backache which might occur following labour. Poor results were those in which no anæsthesia was obtained, due most often from failure to introduce the needle into the sacral canal.

Accurate statistical data cannot be drawn from this series, since we were not able to apply the method in all cases, and so no attempt will be made to tabulate our results for the purpose of statistical analysis. Roughly estimated, however, we have found the method applicable in 58 out of 65 cases tried or in about 89.2%. In other words, we were able to introduce the needle into the sacral canal about 9 times out of 10. If we exclude those cases where

for various reasons, such as sacral deformities, (these are not common in our experience), obesity, or local infections, we were not able to introduce the needle, we are left with 58 cases of which there were 50 excellent results, approximately 86.1%.

As our experience in this method has increased, we are able to advise most expectant mothers whether or not they fall into the category of cases where it will be technically possible to use the method, and so, if the method can be used we may expect completely satisfactory obstetrical anæsthesia in about 85% of cases. In the 8 cases reported as having fair results, 4 developed rather marked nausea and vomiting, 1 case had vertigo to an unusual degree, 1 became irrational for a period of ½ an hour, and in the remaining two cases the needle became displaced when the patients were being turned. All of these cases had good anæsthesia, but, because of the side reactions, or the premature stopping of the anæsthesia due to needle displacement, we did not consider them completely satisfactory.

Certain points of interest in connection with our experiences to date would seem worthy of brief discussion. These items are: The ideal time to begin administration. Method of delivery. Maternal complications. Incidence of asphyxia in the newborn. The use of continuous caudal anæsthesia in elective Cæsarean sections.

1. Our observations concerning time best suited for beginning anæsthesia have led us to believe that the method must not be started too early in the first stage. The presenting part should be well descended to mid-pelvis, the cervix well effaced and dilated to a three-finger opening. When the method has been used earlier, before appreciable dilatation and effacement have taken place, we have found a tendency to prolongation of the first stage of labour, and coincident with this there is the danger of using too large amounts of the anæsthetic drug.

2. *Method of delivery.*—In all primigravid patients, low forceps delivery with episiotomy was necessary due chiefly to the lack of sufficient secondary powers under this form of anæsthesia. A few multiparas delivered spontaneously: however, the rule in the majority of these was low forceps with or without episiotomy. We made it a point in all cases before applying forceps to wait for the formation of a well-defined caput and other evidence indicating adequate moulding of the baby's head. Because of the marked relaxation and loss of tone of the soft parts we found it advantageous to perform the episiotomy before applying forceps in most instances. In this way there was less danger of vaginal wall lacerations. Some observers have noted increased bleeding from episiotomy wounds with this method due to vasodilation; this has not been encountered in our experience to date.

3. No serious complications were noted in the present series. There was one maternal death where this form of anæsthesia had been used, but this death was due to other definite causes. (This particular patient was admitted to hospital in a moribund condition, with general peritonitis, and with an obstructed labour in a slightly contracted pelvis, the baby was dead *in utero*. On examination an extremely moulded head was resting on the perineum. After the patient had been partly restored by blood transfusion, a single injection of 35 c.c. of 1.5% metycaine was introduced into the sacral canal, and the dead baby was easily delivered without serious trauma to the mother. The patient died a few days later from general peritonitis.) Nausea and vomiting frequently occurred shortly after delivery, and occasionally earlier; only in a few instances (noted previously) did this constitute a severe complication. There were no local infections at the injection site, nor deeper infections in the sacral region. In this regard we consider ourselves very fortunate, and we attribute this largely to our policy of not re-inserting needles that become displaced without first removing the needle entirely and re-sterilizing it. In fact we feel that re-insertion even of a re-sterilized needle is a risky procedure, from the aspect of additional local trauma and infection, so that generally when the needle becomes grossly displaced or entirely removed, re-insertion is not attempted and the particular case is carried along by other methods of analgesia or anæsthesia. A few of the patients complained of soreness in the region of the sacrum following delivery for periods varying from 1 hour to 24 hours. This occurrence was usually relieved by local heat and mild sedation with a barbiturate. There was no delay in involution. Bladder and bowel control during the puerperium was not unfavourably affected. Blood pressure fall was not marked in the majority of cases, since we have used 7 minims of adrenalin 1/1,000 solution with each 100 c.c. of anæsthetic solution. One case, however, showed a marked fall; this was a two-gravid, pre-

eclamptic whose blood pressure during the 36th to 38th week had risen to 190/110. With hospitalization and rigid control of diet and restriction of salt, the pressure fell slightly to the level of 180/100. Labour was induced by rupture of membranes and during the 1st stage caudal anæsthesia was started, using pontocaine 0.25% combined with the usual amount of adrenalin. Shortly after the anæsthetic had been administered, there was a marked fall in blood pressure to 130/85 where it remained throughout labour. During her puerperium, which was quite uneventful, the pressure rose slightly to 150/90, subsiding later to a very normal level. We feel that there is a strong possibility that continuous caudal anæsthesia may become a very valuable aid in the management of pre-eclamptics.[9]

4. Asphyxia (or apnœa) of the newborn was not a problem in any of the cases. There was one stillbirth and this has been indicated in the previous paragraph.

5. Continuous caudal anæsthesia was used in 3 elective Cæsarean sections. The results in this limited group were quite good. Inhalation anæsthesia was necessary in one case after the peritoneum had been opened. In the other cases the whole procedure was carried out under the caudal anæsthesia. In all the 3 cases the baby cried spontaneously as soon as it was removed from the uterus. In the most recent case, oxygen was administered to the mother during the time the uterus was being opened and the baby delivered; here, the baby's colour was perfectly pink when removed from the uterus. In these cases the administration of the anæsthetic was begun an hour before operation time and the average total dose was 60 c.c. of 0.25% pontocaine given in divided doses, usually 35 c.c. initially and 25 c.c. a few minutes before operation.

DISCUSSION

I am of the opinion that this form of anæsthesia has an established place in obstetrical practice. However, it must be used with extreme care and judgment in properly selected cases, and, as stated by Hingson and Edwards and others, it should not be used by anyone unfamiliar with the technique of caudal anæsthesia. From our experience to date there does not seem to be any great risk to the mother or the baby when its use is governed by safe principles. Its only great disadvantage is when the obstetrician is acting in the associate rôle of anæsthetist, and there the time factor involved creates considerable difficulties. For this reason, the busy obstetrician will find it difficult and often impossible to use it in as many of his cases as he would like. With this in mind, we feel that the time has come for more concerted efforts and research in the field of obstetrical anæsthesia and analgesia. Much work, of course has already been done, but there seems to have been a general tendency in the past for most anæsthetists to be attracted to the fields of surgical anæsthesia, so that there has not been sufficient collaboration of obstetricians and anæsthetists on the very important problems of anæsthesia which arise in obstetrical practice. Therefore, there is a real need today for anæsthetists who will devote their full time to the problems of obstetrical analgesia and anæsthesia. These persons should of course be well grounded in obstetrics and be able to appreciate the difficulties often encountered before and during labour, and at the same time keep the safety of both the mother and the baby uppermost in mind. With experts of this type available in all our general hospitals, the best methods would be selected for each individual case.

The following is an outline of the general methods of analgesia and anæsthesia used by the writer at the present time.

1. Continuous caudal anæsthesia in all normal cephalic presentations where there is no contraindication for its use. We try to decide this matter as early in the prenatal period as possible.

2. Nitrous oxide and oxygen during the second stage of labour in all breech presentations where the patient will not co-operate sufficiently without relief of some form. An expert anæsthetist is used in these cases so that any risk of anoxæmia in the baby is minimized.

3. In those cases where 1 or 2 do not apply, we employ adequate doses of barbiturates or scopolamine during the early stages of labour, occasionally supplemented by demerol or morphine sulphate in small doses. For delivery in these cases we favour local infiltration of the perineum or pudendal nerve block with 1% novocaine for performing episiotomy and carrying out its repair. In restless individuals, inhalation anæsthesia or intravenous pentothal sodium are used for delivery.

5. In elective Cæsarean sections where time and conditions permit, we prefer continuous caudal anæsthesia with 0.25% pontocaine. In other cases local infiltration with supplementary inhalation anæsthesia or intravenous pentothal is used.

The writer gratefully acknowledges the valued assistance of the interns of the Kingston General Hospital, Miss McCulloch, Miss Blanchard and Miss Stevens of the Maternity Department of the Kingston General Hospital for their help in collecting the cases used in this report.

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PROBLEMS IN X-RAY LOCALIZATION OF FOREIGN BODIES IN AND ABOUT THE EYE*

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WHEN asked to present a paper on this subject I hesitated as the subject seemed to be more in the field of radiology. But, while the exact localization of foreign bodies which cannot be seen by focal illumination, the slit-lamp, or the ophthalmoscope, may be definitely in the field of radiology, the correlation of their location with the structures involved and the removal of the foreign bodies are entirely ophthalmological.

The question of foreign bodies in and about the eye is a very important one at all times, but particularly so during the war. In this country while we are confronted with but few recent war injuries, I think with the return of our wounded, many patients will be found with foreign bodies in and about the eyes which have escaped detection both by the patient and members of the medical services. Added to this will be the dissemination of these patients throughout the country where all necessary equipment for their treatment may not be available. On this basis alone, therefore, it is opportune to discuss the subject of localization of foreign bodies so that we may elaborate the best means at our disposal for their detection and treatment under the various conditions which do now and may later exist.

X-rays should be taken of all cases where foreign bodies about the eyes are suspected or cannot be excluded. The only exception might be where the foreign body can be seen within the eye, but even here it is often necessary to determine whether or not it be metallic, if there be more than one foreign body, and also for information regarding its size. For this purpose antero-posterior and lateral films should be taken, preferably two of each to avoid artefacts on the film. If a foreign body be present and it cannot be definitely placed outside the globe, localization should be proceeded with.

Here it is necessary to recognize the purposes of localization. These may be classed under three headings: (1) To determine whether or not the foreign body is within the globe. (2) To ascertain if there has been a change in position of the foreign body within the globe after magnet extraction has failed. (3) To obtain the closest proximity of the foreign body to a point of incision in the sclera through which the foreign body may be removed. This applies especially to non-magnetic foreign bodies.

When a giant magnet is available for extraction by the anterior route it is evident from the above that if a foreign body can be seen in the anterior part of the eye, or with the ophthalmoscope in the posterior part of the globe, localization is unnecessary. Similarly, when a perforating wound of the cornea is present, together with a traumatic cataract, and perhaps a hole in the iris, localization is unnecessary. In fact, in both these instances the giant magnet may be applied even without x-ray. However, should there be no response after repeated attempts, x-rays must then be taken, and if a foreign body be present localization proceeded with. If a giant magnet is not available and the small magnet is to be used for posterior route removal, localization is necessary, and if the foreign body be non-magnetic the localization is even more important. Because, as stated above, the site of operation will be determined on the position of the foreign body.

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According to Twining and Shanks,[1] and Pancoast, Pendergrass and Schaeffer,[2] x-ray methods of localization may be classified as follows:

Simple methods.—Radiographs taken in two or more planes, usually lateral and anteroposterior. The foreign body is localized with reference to some fixed marker applied to the lid or conjunctiva for that purpose. Many types have been advocated by various workers, such as lead glass moulds, lead buttons sewed to the limbus, wire frame, contact glasses, celluloid moulds, and silver clamps. These methods are not recognized as adequate for a complete report to guide the surgeon operating.

Stereoscopic methods.—These require the use of fluoroscopic screens or radiograms made by using various angulation principles. They must be done under great care as the parallax angles are usually so minute that they are unreliable.

Geometric methods.—These depend on fixation of the eyeball and localization of the foreign body by measuring its position in relation to a fixed marker at a known distance from the centre of the cornea. This information is charted on diagrams of the three equatorial planes of the eyeball. The diagrams assume a constant diameter of the globe which introduces error, and the methods are complicated and require more skill and accuracy than is at times available.

Physiological methods.—These include bone-free radiographs of the globe, injection of materials into Tenon's capsule, and fluoroscopy.

Many of the methods advocated are combinations of those enumerated above. The fact that so many methods are used indicates that the necessary accuracy is not obtained by any single procedure thus far generally accepted.

Another method which might be called a subjective one is that described by Pirie,[3] in which the patient localizes his own foreign body. The dark-adapted patient has his retina stimulated by x-ray and if a foreign body be present within the globe he sees the shadow cast on the retina. However, injuries of the retina produce the same effect, and should the shadow fall on his blind spot it is not detected.

Apart from the methods of localization by x-ray, mention should be made of the sideroscope of Asmus,[4] which has not found much favour except in Germany. More recently the Berman locator, on the same principle, has been used in general surgery with success by Moorhead,[5] and in eye work by Minsky.[6] It seems to have a definite place with foreign bodies located in the posterior part of the globe when their removal by the posterior route is necessary. For non-magnetic foreign bodies the biplane fluoroscope has been used by Cross[7] for locating and removing foreign bodies in the vitreous. Thorpe's[8] ophthalmic endoscope is also available for a similar type of foreign bodies located in the vitreous.

The method of Sweet,[9] although first described in 1898, and improved in 1909, is still considered the most accurate. It belongs to the geometric group quoted above, and is accurate to 1 millimetre. We have employed it almost exclusively for many years. The disadvantages are that the equipment is expensive and the improved model cannot be obtained during the war. It is also possible that many radiologists are not familiar with its use, although this latter disadvantage should be easily overcome. The localization chart designed to use with the localizer shows the size and the position of the foreign body in three planes. The likely dissemination of patients on their return to Canada, and the fact that the Sweet localizer is not everywhere available, makes its use restricted. The same disadvantages may be claimed for the Comberg[10] method where a contact glass is used. The McGrigor[11] eye localizer, which was supplied to the medical service of the Canadian armed forces, is being replaced by the original Sweet localizer in the naval medical service. This is due to the fact that satisfactory films cannot be obtained on this side of the water.

It is evident that for general use, especially in smaller centres, one of the simple types of localization is perhaps the best. The attachment of silver vessel-clamps to the conjunctiva above and below the cornea, as described by Jervey,[12] would seem as accessible and satisfactory as any. Stallard,[13] who just reported the results of 102 cases of intraocular foreign bodies in the African campaign, described the method of localization employed. It belongs to the simple methods and proved satisfactory, even though many of the foreign bodies were non- or poorly magnetic and had to be removed through the posterior route.

Accurate localization of extraocular foreign bodies within the orbit is not so necessary. Whether this is obtained by stereoscopic films or by single plane films taken at different angles

is of minor importance, and as Spaeth[14] says, both methods should be used. It is probable that the Berman locator may be of decided help in such cases.

I have reviewed the records of the last hundred patients admitted to the Royal Victoria Hospital for foreign bodies within the globe. Of these, x-rays were not taken in 15 cases, since all had perforating wounds of the globe, and in at least 9 the lens was injured. In 16 others, accurate localization was not carried out. In 30 of these 31 cases, foreign bodies were removed from the globe by magnet extraction. In all the remaining 69 cases, the Sweet method of localization was the one employed. In one case, the x-ray was negative, but a foreign body was extracted by the magnet. In three others the foreign body was localized outside the globe, yet foreign bodies were removed from the globe in all three with the magnet. In two cases the eye was obviously lost and was enucleated without using the magnet; and in seven cases the foreign body was non-magnetic or failed to respond to the magnet. In two of these the eye was removed. Of the 100 cases, 20 eyes were enucleated during the stay in the hospital, and 55 had cataracts. A final point worth mentioning is that one BB shot localized just outside the eye was removed by the magnet. This is mentioned to emphasize the fact that some of the shot used in air rifles is made of magnetic metal, and the magnet should be applied in all air rifle accidents when a shot is present.

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Books can never teach the use of books. The student must learn by commerce with mankind to reduce his speculations to practice and accommodate his knowledge to the purposes of life.—*Bacon.*

GONORRHŒAL KERATOSIS

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GONORRHŒAL keratosis, also known as hyperkeratosis or keratodermia blennorrhagica, is a skin disease complicating gonorrhœa.

All textbooks consulted on the subject agree that this skin condition is a very rare complication of gonorrhœa. They agree that it appears in the fourth or fifth week of the disease and is only associated with severe metastatic complications such as arthritis or iritis. Its intensity varies with the virulence and tenacity of the gonorrhœal infection. The regions most affected are the feet and hands, although the trunk may be involved, the site most favoured being the plantar aspect of the feet.

Lees,[1] writes: "It commences as small red vesicles, which later develop into papules with a horny centre and a tendency to crust formation. The horny centre proliferates until a limpet-shaped protuberance, surrounded by thickened epidermis, is formed." Luys,[2] states: "The lesion is like that of a corn, or of a conical protrusion, or a large hard irregular patch composed of hypodermic horny masses." Harrison,[3] writes: "The skin of the affected areas becomes tough, like leather, and a number of nut-brown nodules form in it, which are dome-shaped and vary in diameter from a large pea to a threepenny bit. On pressing such a nodule with the tip of a finger, the feeling is as if one were pressing on a blister which had lost its contents but retained its shape, by virtue of the rigidity of its celluloid-like covering. The nodules contain a cheesy material in which it is stated that gonococci have been found; between them the skin also becomes greatly thickened, and the appearance is usually described as one of hills and dales. The nails may be involved, becoming enormously thickened." According to Pelouze,[4] "The disease is very infrequent on this continent".

The case now being reported is the only time this complication was encountered in my series of nearly 4,000 cases of gonorrhœa.

A.H., male, Finnish farmer, aged 43, crawled into the office on his hands and knees. His story was that about five weeks previous to reporting, he had contracted a urethral discharge. A few days later he had a steam bath. This was followed by what he called loss of power in his legs. Later he developed painful growths on the soles of his feet.

The man was in a pitiful condition. He had a flexion deformity of the hips and knees of nearly ninety degrees. These were correctible without difficulty but gave him considerable pain on manipulation. Both ankles had considerable periarticular thickening, with extension deformity. He had a slight urethral discharge with many shreds in the urine. His prostate was boggy and the seminal vesicles could be palpated. Intracellular diploccoci were found in smears of the urine and prostate secretion. The soles of his feet were an amazing sight. The whole plantar area was covered by a very hard thickened layer of epidermis, and on the heels and across the heads of the phalanges were several areas that appeared like a cross between a corn and a horn. The mid-portion of each of these areas was pitted and a foul-smelling cheesy material could be expressed.

The man was admitted to the hospital. Blood and spinal fluid examinations were made and found negative. He was placed under treatment for gonorrhœa. He was given injections, deep instillations and prostatic massage, with improvement to his urethritis but little to his arthritis or skin. I gave him intravenous injections of three minims of typhoid and paratyphoid combined vaccine every four days. He had a good reaction after each injection with relaxation of his joints. Meanwhile the soles of his feet were being painted daily with a solution of 5% salicylic acid in collodion. After two weeks of this combined treatment, a full range of motion to ankles, knees and hips was secured. A line of cleavage showed on the soles and with little difficulty I was able to peel off the thickened epidermis from just below the toes to the turn of the heels. This came off in one piece and was like a mould of the sole of the foot. The underlying dermis was smooth, pink and clean. While the man had full use of his limbs, it was necessary for him to stay in bed for some time until the soles became thickened enough to take his weight.

His posterior infection was a very stubborn one to eradicate, taking a long course of instillations and massages and was one of the few cases in which I have considered it advisable to do a vasotomy and inject the vas deferens with fresh 5% argyrol. I was successful in clearing up the infection in time and the man returned to his farm. I saw him recently and he spent the winter in a pulp-camp with no difficulty or discomfort.

SUMMARY

1. A case of gonorrhœal keratosis is reported.

2. The following observations are confirmed: (*a*) It occurs with associated severe complications. (*b*) The main treatment must be directed at the original infection.

3. This case was encountered in the days before sulfonamide therapy.

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BENZENE POISONING

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FOR the past two decades the industrial use of benzene diminished steadily with the introduction of less toxic substitution products into manufacturing processes. With the advent of accelerated war-time manufacturing, an increasing scarcity of these substitution products has necessitated the re-introduction of benzene. As a result, benzene poisoning cases may show an increased incidence unless the potential dangers are understood and avoided.

Two recent fatalities following the accidental ingestion of small quantities of an aniline derivative of benzene served to recall the importance of this substance and suggested the desirability of a revaluation of the subject. Because of the widespread and sometimes unwitting use of so toxic a substance, every physician engaged in part-time or exclusive industrial practice and those in general practice as well, should investigate carefully the chances of occupational exposure to benzene or to chemically similar by-products in the workers under their supervision. In large industrial plants the potential dangers of benzene are well-recognized and comparatively easily avoided but in smaller plants where supervision may not be so stringent, the hazards of exposure often are greatly increased.

Benzene, or benzol, is an inflammable coal-tar derivative, an unsaturated hydrocarbon with formula C_6H_6, and should not be confused with benzine, which is a mixture of aliphatic hydrocarbons derived from petroleum. Discovered by Faraday in 1825, benzene is a colourless, volatile liquid with slight but not unpleasant odour. Although relatively insoluble in water, it is freely miscible in all proportions with alcohol and ether.

Seldom used in pure form, benzene is an essential ingredient of many industrial reagents. Over one-half of the thousands of carbon compounds are the offspring of this ubiquitous chemical. The dye industry finds it indispensable as the parent of aniline and its entire series of synthetic dyes. Benzene is used to extract fats, resins, waxes and oils beside being extensively employed in making lacquers, paints, stains and varnishes. Many paint and varnish removers contain benzene as the active agent. The

high explosive picric acid and synthetic carbolic acid (phenol) are made from benzene. The manufacture of linoleum, artificial leather, certain types of wet-proof clothing, celluloid and many of the modern plastics depend upon benzene. In addition, benzene is used widely in processing by bronzers, electroplaters, engravers, enamelers, dry battery makers, lithographers and rotogravure printers. An important usage is as a solvent for cementing substances in the rubber industry. Fatalities or near fatalities due to benzene fumes or splashing have been reported from these industries and many others.

An excellent fat solvent, benzene is readily absorbed through the unbroken skin. Its major portal of entry into the body, however, is through the respiratory tract, absorption taking place in the lungs. Slight effects of poisoning may be manifest in susceptible persons where the air contains 15 parts of benzene per million parts of air while 20 to 30 parts may induce coma. The maximal permissible benzene concentration is now accepted as 100 parts per million when the duration of exposure does not exceed more than eight hours daily. Benzene may be absorbed from the intestinal tract but this mode of entry is negligible in industry and can occur only through gross negligence or pure accident.

Animals and human beings vary considerably in susceptibility to the toxic effects of benzene exposure. In experimental work it is found that dogs are less resistant than rabbits. Kracke reports that the intravenous injection of minute quantities of benzene produces sudden death in the usual laboratory animals. As for human beings, it is generally regarded that young people are more easily affected than more mature people while negroes are more resistant than whites. In this respect, Schmidt concludes that, as a truism of industrial disease practice, adult hazards are doubly dangerous to youth, partly due to increased susceptibility, partly because youth will not exercise the caution and judgment of adults.

It is generally conceded that women are more easily intoxicated by benzene fumes than are men. This is of exceptional importance in view of the number of women engaged in war work. Hamilton states that it is a great risk to permit young girls or pregnant women to work with benzene. In 1897, Santesson described fatal benzene poisoning in four girls after exposures varying from three weeks to four months. He saw a total of 12 cases, all in working girls from 15 to 20 years of age, who were employed in a velocipede factory in Sweden. The causal agent was benzene incorporated in a rubber cement. On this continent Selling was the first to report four cases of fatal aplastic anæmia as a result of exposure to benzene, all in women working in a tin can factory. Additional cases of benzene poisoning in women are recorded in the literature and likely many more have gone unmentioned or unrecognized.

In acute benzene poisoning there are few clinical findings of note. The signs and symptoms are not specific and could be mistaken easily unless one were aware of the recent history of exposure to benzene. Inhalation of the vapour leads to inebriation with impaired judgment, followed by fatigue, sleepiness, tinnitus, dizziness, nausea and vomiting, headache and toxic gait. If inhalation continues muscle twitchings occur, merging into tonic and clonic convulsions, paralysis, and coma. Death from acute cerebral and pulmonary œdema may occur within a matter of minutes. Hamilton reports a case of sudden death in a man after just four minutes exposure to benzene.

The earliest necropsy report is that of Sury-Bienz in 1888; it mentions conspicuous bright red spots on the body surface, generalized venous congestion, non-coagulated and darkly coloured blood, intestinal and pleural hæmorrhages and frothy blood-stained mucus in the bronchi. H. S. Martland has described more recently autopsy findings in two cases of acute poisoning; in addition to Sury-Bienz's observations, he noted acute interstitial emphysema, cyanosis of the mucosæ and finger-tips, and a decided odour of benzene from the incised lungs. Others have reported blood-stained fluid in the pleural cavities, severe fatty degeneration of the liver, myocardial infarcts and subendocardial hæmorrhages and necrosis of the suprarenal glands.

Chronic benzene poisoning is more common than the acute type. It creates, in susceptible persons, a disturbance of hæmatopoiesis, usually of the aplastic type, and results in more or less permanent changes in the parenchymatous organs. The action is often insidious and the results of chronic exposure may not be manifest immediately but delayed for some time.

For years standard textbooks have held that leukopenia is the characteristic response to benzene exposure. As a sign of poisoning,

leukopenia was emphasized by Selling and subsequent authors continued to describe it as the prime evidence. It should be recognized more widely that leukopenia is not the only diagnostic sign of chronic benzene poisoning and indeed it may be absent in some cases. In Greenburg's series 85% of the patients had a normal white cell count. It is true that among the results seen, aplastic bone marrow lesions are the most striking but the peripheral blood picture may extend from severe aplasia to varying degrees of leukocytosis and even to leukæmic findings.

According to Mallory, the deciding factor in the type of bone marrow reaction to benzene is not so much the intensity but the duration of exposure. Exposure for less than one year results generally in hypoplasia of the marrow while more prolonged exposure results in marrow hyperplasia. In other words, the initial reaction is depression, the secondary reaction is stimulation. The state of the marrow and the blood picture are dependent upon several factors, the degree of exposure, length of exposure, and individual susceptibility.

The reason for the destructive action of benzene on the bone marrow is not known. It is doubtful that the marrow can be depressed by benzene absorption through the skin. Kracke believes that the inhalation of benzene fumes has little effect in the majority of people because of chemical detoxification in the liver before the substance can damage the bone marrow. One unproved theory is that variations in the quantity of blood lipids control the amount of benzene which can be taken up and "bound" or rendered inert; as the lipids become saturated with benzene, the excess acts in a toxic manner upon the marrow.

Other organs of the body also show pathological changes as the result of chronic exposure to benzene, notably the spleen, the liver and the lymph nodes. The spleen is practically always involved. It is often enlarged but this may be insufficient to be detected clinically. The microscopic appearance varies from the presence of well-defined foci of hæmopoiesis to a diffuse intrinsic degeneration and generalized fibrosis where finally the arterioles only may remain in the centres of sclerosed Malpighian bodies. The liver presents a similar but less striking picture, with hæmosiderin-laden Kupffer cells and a variable degree of extramedullary erythropoiesis. A progressive fibrosis is also noted in the lymph nodes. Regenerative islands of hæmopoiesis are seen in the nodes, sometimes so diffuse as to obscure the normal architecture, the loose fibrous stroma being infiltrated with lymphocytes, lymphoblasts, stem cells, normoblasts, and multinucleated giant cells, suggesting by its pleomorphism a diagnosis of Hodgkin's disease.

A paradox that is not easily explained is the apparent finding that benzene poisoning may initiate leukæmia. Falconer describes a case of lymphatic leukæmia in a tin can factory worker following benzene exposure. Ewing refers briefly to a report by Bungeler who produced leukæmia experimentally by injections of benzene into mice. Two cases of benzene-leukæmia have been fully investigated by Mallory. In one of these patients, a typical picture of acute myeloid leukæmia developed in the last three months of life following exposure to benzene for 10 years. At autopsy there was a diffuse myeloid infiltration of the liver, spleen and bone marrow. It is well-known that a lasting leukocytosis often occurs in workers exposed to benzene, even after removal from the source of exposure. A similar persistent leukocytosis occurs in certain individuals following sulfonamide therapy. Kracke has intimated recently that leukæmoid blood findings and perhaps some instances of leukæmia are initiated by sulfonamides which are chemically closely related to benzene. A recent authoritative answer to the question of benzene-leukæmia relationship stated that evidence so far obtained is "only fragmentary and certainly questionable".

The earliest signs of disturbed hæmatopoiesis can be detected in exposed persons by maintaining careful hæmatologic charts, including total red and white counts, hæmoglobin estimations, and examination of the blood smear once every four weeks. Important findings are the development of an otherwise unexplained anæmia with significant reduction in hæmoglobin percentage, a total white blood count below 5,000 cells per cmm., and a reduction in the percentage of neutrophils. Hunter has shown that the percentage decrease in neutrophils is an earlier and better index of early benzene poisoning than is leukopenia. In fatal cases in his series, there was a definite decrease in the absolute number of neutrophils and he offers this as a prognostic sign of considerable value. In those cases where there is a

stimulation of the bone marrow, myelocytes and irritation forms of leukocytes are seen in the peripheral blood stream. Therefore, the simple total white count as commonly used is not sufficient objective evidence; it must be accompanied by differential blood smear, along with red count and hæmoglobin estimation, to ensure early recognition of bone marrow injury.

Above all, prevention depends upon knowledge of employer and employee that benzene is being used; this information is an adequate "ounce of prevention". Industrial benzene poisoning occurs chiefly through ignorance. Technical procedures should be instituted so that a minimum of exposure to actual fumes results. Careful avoidance of spilling liquid benzene on the body and adequate exhaust ventilation must be insisted upon.

A lengthy list of References may be obtained from the author, Provincial Laboratories.

CONGENITAL SYPHILIS*

By Frederick Kalz, M.D.

Montreal

IN considering the problem of congenital syphilis it is necessary to begin by emphasizing the fact that this is a preventable disease. It is, of course, well known but it cannot be stressed too often that if sufficient and regular treatment is instituted prior to the fifth month of pregnancy, a syphilitic mother will give birth to a healthy child, and even if treatment is delayed until after the beginning of the fifth month, the chances that a non-syphilitic child will be born are still three out of five. Yet, although these facts are familiar to everyone, there is reason to believe that the incidence of this disease in Canada is relatively not much lower than it is in the United States where a probable 60,000 congenital luetics are born each year.

This situation is in contrast with conditions in the Scandinavian countries which have an excellent record not only in the fight against syphilis as a whole but also in the field of prevention of pre-natal syphilis. In the year 1936 the city of Copenhagen, for example, had only nine new cases of congenital syphilis, an achievement which is all the more remarkable when it is remembered that Copenhagen is, or was at that time, a great seaport.

What, then, is the explanation for the high incidence of congenital syphilis in this country? Since the disease is preventable, its far too frequent occurrence is explainable only by the fact that the infection in expectant mothers is either not detected at all, or detected too late, or if detected in time, insufficiently treated. Obviously a certain proportion of cases are due simply to the failure or inability of the expectant mother to seek the medical care and supervision during pregnancy which is essential for many reasons other than the detection of syphilis, but this does not account for the numerous cases in which the children of mothers who have received pre-natal care are nevertheless born syphilitic.

In view of the nation-wide campaign now under way in Canada, it is important to place the responsibility for the present situation with regard to congenital syphilis where it belongs. Is the high incidence of the disease due to ignorance on the part of the mother, or oversight on the part of the physician, or both? If the ignorance of the mother and of the public in general were found to be the main reason for the existence of present conditions, a general educational program would be indicated; if, however, the responsibility was found to rest with the physician in the majority of cases, the educational program should be aimed in that direction, chiefly in the form of improved teaching of syphilis its prevention, treatment and management.

In an effort to solve this question, all mothers of congenital syphilitic children in our services, were questioned regarding their prenatal care. In some instances more detailed information was obtained by contacting the physician by whom the patient had been seen.

TABLE I.

PRENATAL HISTORY OF 74 CONGENITAL SYPHILITIC CHILDREN

Physician consulted during pregnancy	*Physician not consulted*	*Total*
57	17	74

TABLE II.

STAGE OF PREGNANCY IN WHICH PHYSICIAN WAS CONSULTED

1st to 5th month	*5th to 8th month*	*Time not remembered*	*Total*
35	14	8	57

* Read at the Seventy-fifth Annual Meeting of the Canadian Medical Association, Section of Dermatology, Toronto, Ont., May 24, 1944.

From the Department of Medicine, Section of Dermatology, Royal Victoria and Children's Memorial Hospitals, Montreal, Que.

As seen from Tables I and II a physician was consulted in the majority of cases and in most instances, at a stage of pregnancy when infection of the fetus could easily have been prevented.

TABLE III.

MANAGEMENT OF 57 PREGNANCIES UNDER MEDICAL SUPERVISION

No blood test done. Syphilis not discovered	49
Blood test done at beginning of pregnancy—not repeated, infection during pregnancy not discovered	5
Syphilis in mother diagnosed. No treatment or insufficient treatment given	3
Sufficient treatment given	0
Total	57

From Table III it appears that in 49 instances blood tests were not done, the syphilis was not diagnosed, and the responsibility for the birth of a luetic child remains with the physician in charge of the case.

Of particular interest is the group of 5 cases in which serological reactions were negative in the early months of pregnancy but subsequent infection was overlooked. Three of these case histories are given in detail.

CASE 1

A young French-Canadian woman was found to have a negative Wassermann reaction in the second month of pregnancy. During the sixth month a vulvar lesion appeared but was disregarded by the family physician who relied on the previous negative serological findings. This resulted in a syphilitic stillbirth and the vulvar lesion was found to be a condyloma containing numerous spirochætes. The blood Wassermann reaction was found to be positive in a dilution of 1:192 at this time.

CASE 2

A young French-Canadian woman was found to have a negative Wassermann reaction during the second month of pregnancy. An ulcer on the vulva, obviously a primary lesion, occurred during the third month. Blood tests were repeated and again found to be negative. Dark-field examination was not done and no attempt to re-examine patient was made. During the seventh month of pregnancy, patient was seen in the out-door clinic at the Royal Victoria Hospital and a widespread maculo-papular cutaneous syphilis was diagnosed. Treatment was instituted at once, but illness prevented patient from attending regularly and a syphilitic child was born six weeks later.

CASE 3

This case is of particular interest. The husband of a 26-year old Canadian woman was receiving treatment for early syphilis from his family physician. She was examined in the early weeks of pregnancy, and found to be free of symptoms and with a negative Wassermann test. Instead of keeping the patient under observation until a diagnosis could be definitely established, therapy was started and 10 injections of mapharsen 0.06 gm. were given at ten-day intervals. The patient was then told that she was safe and blood tests were not repeated. Such a treatment scheme, while unnecessary if syphilis was not present, was certainly insufficient to prevent or cure a syphilitic infection or to protect the fetus. This error resulted in the birth of a syphilitic infant with cutaneous lesions and Wassermann reaction positive in a dilution of 1:196, while the mother, although free of clinical symptoms, had a Wassermann reaction positive in a dilution of 1:48. This was one of the few instances in our material in which the titre of the maternal blood was found to be significantly lower than that of the infant.

This group of cases demonstrates the advisability of repeating a blood test around the 5th month of pregnancy, in order to diagnose in time a possible syphilitic infection occurring during pregnancy. It is well known that pregnancy has a mitigating influence upon luetic symptoms and infections have a tendency to run an asymptomatic course.

In the last group of Table III, in three instances syphilis was diagnosed early in pregnancy by serological tests but treatment was not given. In two cases the laboratory report was disregarded and the mother was not urged to undergo treatment. In the third case the mother was advised to start treatment at once but she failed to do so. In this instance the responsibility rests with the mother.

SUMMARY AND DISCUSSION

Summarizing the findings listed in the tables, it appears that ignorance of the mothers accounted for the birth of 18 syphilitic children. In 17 instances medical advice was not sought and in one instance it was disregarded.

In 56 cases responsibility rests with the physician. In 49 cases, blood tests were not done, and the syphilitic infection remained undiagnosed, while in 5 instances infection occurred during pregnancy and was overlooked, and in 2 cases failure to act quickly on the diagnosis and to institute treatment was responsible for the birth of syphilitic children.

Similar conditions were found in a recent investigation of the histories of 260 neurosyphilitics. The great majority of these patients had also been under medical care, and although syphilis had been diagnosed in some instances, severe complications were allowed to develop through lack of diagnosis and inadequate treatment of the neurosyphilis by the physician.

Detection, management and treatment of syphilis in Canada is largely in the hands of the general practitioner, and it would be neither just nor constructive to burden him with full responsibility, without giving him every opportunity to become familiar with the intricate course of this disease and without providing him with all possible facilities for controlling it. The Provincial government of this and other Prov-

inces provide for free serological investigations and free drugs.

Organized and co-operative teaching of syphilis in medical schools is of the greatest importance. A few theoretical lectures presenting the basic principles combined with practical work in syphilis clinics, would be of the greatest value in making the young practitioner of the future familiar with all phases of this disease; its detection, management, treatment and prevention. Postgraduate courses would keep the practitioner informed of new developments in chemotherapy and public health measures.

Teaching hospitals could fulfill an important function by establishing diagnostic clinics to which the practitioner might send complicated and obscure cases for complete examination and diagnosis and for suggestions regarding future treatment and management.

While the control and the ultimate eradication of syphilis is necessarily a slow and complicated process, congenital syphilis represents a fairly simple problem. It is first and foremost a preventable disease which, if detected early enough and sufficiently treated, could be stamped out now. The means of prevention have been at our disposal for years, all that remains is to make use of them. With the continuing progress in medical science and especially in view of the encouraging results obtained from the use of penicillin, therapeutic problems in the treatment of syphilis are gradually becoming more simplified. Of the venereal disease problem as a whole, which is a matter of such profound concern to every thinking person in this country at the present time, prevention of congenital syphilis is one aspect which offers a comparatively quick and easy solution. If we have not yet reached a point where the effects of syphilis can be prevented in later life, at least children need no longer be born with it.

1414 Drummond St.

RÉSUMÉ

L'ignorance des mères syphilitiques, la négligence de certains médecins, le laisser-aller de beaucoup de contaminés sont les causes de la persistance d'un mal dont la disparition est indûment retardée. Le praticien a déjà beaucoup de facilités dans les voies du diagnostic et du traitement; il faudra cependant, maintenir sa curiosité scientifique et le tenir au courant des nouvelles méthodes d'investigation et de traitement. Les hôpitaux devront aider le praticien dans les cas compliqués de sa clientèle. La syphilis congénitale, dans ces conditions ne devrait plus exister. JEAN SAUCIER

Case Reports

REPAIR OF CONGENITAL DIAPHRAGMATIC HERNIA IN AN INFANT

By Anna Wilson, B.A., M.D. and K. R. Trueman, B.A., M.D., M.Sc.(Minn.)

Winnipeg

Diaphragmatic hernia in infants is rare. When present, however, it is a dangerous condition and according to Hedbloom, 75% of such cases die before the first month of life has elapsed. Many cases doubtless pass unnoticed and the condition continues to be compatible with life and normal living. However, in infants persistent cyanosis, unusual dyspnœa and perhaps vomiting and feeding difficulties should suggest the possibility of diaphragmatic hernia interfering with the physiology of the cardiac, respiratory, and digestive systems. The suspicion should be heightened if physical examination or a roentgenogram of the chest reveals a displacement of the heart to the right. A special x-ray examination for hernia is then indicated.

The treatment for diaphragmatic hernia in the newborn is early surgery. Where there is fear that the infant will not tolerate such a procedure, and where there is no progressive deterioration, it is reasonable to carry it over a critical interval with careful nursing until it is better prepared. Nevertheless the danger of strangulation of the bowel, of acute pulmonary failure, occurring in the presence of impaired respirations, etc., make the case an uneasy one to watch placidly. Surgery undoubtedly carries a high risk of mortality in this type of case, and surgeons may be deterred by a previous failure or by an unsuccessful case heard of elsewhere. Such a failure may depend upon the condition found at operation. Very large defects in the diaphragm are sometimes present, defying closure even when the most skilful and elaborate plastic procedures are employed. On the other hand, a defect may be encountered quite amenable to repair and then a simple operation is all that is necessary for a cure. The following case illustrates this point:

Baby P., male, was born on February 2, 1944, of a primiparous mother following a Cæsarean section performed by one of us (A.W.). The mother had had pre-eclamptic toxæmia, necessitating hospitalization on two occasions. She went into labour several days

before term. The reason for intervention was fetal distress after 24 hours of labour, as revealed by irregularity of the fetal heart sounds. Immediately after birth the infant's condition was satisfactory. When it was placed in the nursery, however, it became blue and dyspnœic and the administration of oxygen was necessary. Feeding difficulties were soon encountered, the baby refusing to eat and regurgitating what was introduced into the stomach by means of a catheter. On the sixth day, the fear of aspiration of fluid at feeding time led to a more careful examination, together with a chest film. This revealed that the heart was displaced markedly to the right and the lower half of the left lung was replaced by what appeared to be either an unusually high diaphragm or a diaphragmatic hernia.

A barium meal on the eighth day revealed the stomach and duodenum to be in the abdomen, but the small bowel was seen to be occupying a large part of the left side of the thorax (Fig. 1).

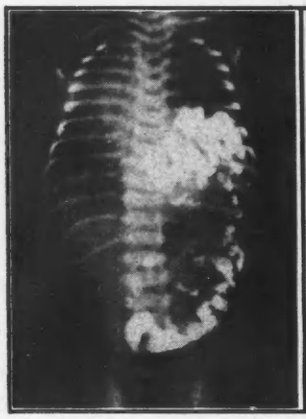

Fig. 1

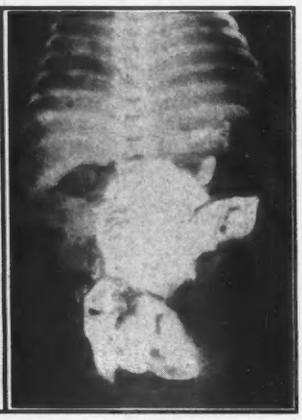

Fig. 2

Despite periods of rapid and often laboured respirations the general condition of the infant remained satisfactory. After an initial weight loss of five ounces it began to gain and by March was restored to its original weight. A month after birth its condition was considered satisfactory for operation.

On March 3, a preliminary left phrenicotomy was performed in order to immobilize the diaphragm on that side. The object of this procedure was to simplify the reduction of the hernia at the later second stage. Also the immobility gave more assurance of good healing when the diaphragmatic defect should be closed. The phrenic nerve was found through the usual supraclavicular approach. After crushing the nerve a fluoroscopic examination of the chest revealed the left diaphragm to be paralyzed. There was no substantial change in the patient's condition following this operation.

A week later a laparotomy was undertaken through an upper left rectus incision, using ether anæsthesia. As was already known, the stomach was entirely below the diaphragm. In the dome of the left side of the diaphragm, and somewhat posteriorly was an opening about two inches in diameter. Through it the whole of the small bowel and the greater part of the large bowel, excluding the cæcum and the sigmoid, had reached the thorax. In addition, the spleen was found above the diaphragm. A most difficult organ to identify above the diaphragm was the left kidney, which it is expected has rarely been found in the chest, and no satisfactory explanation as to its unusual position is available.

As soon as the chest was emptied of its abdominal contents the aperture in the diaphragm was closed. As is the rule in this type of case, there was no hernial sac to remove. The repair was effected by the application of four interrupted heavy silk sutures. Prior to tying the last suture of the closure an effort to reduce the left-sided pneumothorax by aspirating the air was made. As no intratracheal tube had been used, the lung could not be inflated as would otherwise be possible. The closure of the abdomen was made somewhat difficult by the unaccustomed presence of the viscera in that cavity.

The postoperative course was uneventful. The heart had occupied its normal position a few days after the operation and a chest plate revealed the left lung had expanded. Feedings were taken well and a satisfactory weight gain resulted. Dismissal from the hospital was three and a half weeks after the operation at which time the weight was eight pounds, one ounce. A barium meal recently revealed the small bowel to be within the abdominal cavity. The left diaphragm had regained its function (Fig. 2).

MEDIASTINAL ABSCESS*

By J. Carl Sutton, M.D., C.M., D.A.B.S.

Montreal

Mediastinal abscess is a pathological condition which is not frequently encountered. It is accompanied by very distressing symptoms, which are primarily respiratory distress associated with dysphagia. The condition is often of short duration and death frequently results from delay in recognition and, as in this case, possibly from improper choice of anæsthetic.

Whilst mediastinal infections are more common than one suspects, according to Neuhof,[1] they still are relatively infrequent. In 113,098 admissions at the Montreal General Hospital from 1933 to 1943 there were 21 cases of mediastinal infections from all causes. Even presuming that a goodly proportion were diagnosed improperly, there were only 15 cases in 2,908 autopsies during this period, in spite of their high death rate and our high percentage of autopsies (60%).

The most common sources as reported by Neuhof[1] were infections of the neck and traumatic perforations of the cervical and thoracic œsophagus. A peri-œsophageal abscess appears to be the first phase after perforation of the œsophagus.

INDICATIONS FOR OPERATION

It seems to be the consensus that in any perforation of the œsophagus from instrumentation

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or by a foreign body, the sooner the œsophagus is exposed through an external opening, the lower would be the death rate, because it is seldom that the abscess would drain spontaneously through the œsophagus.

In Neuhof's series of 66 cases of acute infections of the mediastinum which is the greatest series in literature, there were 34 cases in which no operation was performed, and 32 in which some operative procedure was carried out. In the non-operative group there were 9 recoveries and 25 deaths; in the 22 operative cases reported there were 15 recoveries and 7 deaths. Death occurred in all non-operative cases in which mediastinal abscess developed.

There are, of course, many perforations of the œsophagus caused by instrumentation. In 1935 Thomas E. Carmody published 8 such cases.

A young girl, aged 15, was admitted to the hospital on March 1, 1944, complaining of a very sore throat; difficulty in swallowing; difficulty in speech; nausea and vomiting since Friday, February 25. During the evening of February 24, the patient drank milk directly from a bottle, a loose fragment of which it is believed became detached or in which there was a foreign piece of glass, and next day her throat became sore and had been getting gradually worse. She had had only fluids by mouth since February 25. On

Fig. 1.—Lateral view. (A) Foreign body. (B) Trachea pushed forward. (C) Cervical vertebræ in straight line. (D) Fluid level cupping mediastinal mass.

Monday, February 28, she called in her doctor who suspected cervical adenitis because of a past history of swollen cervical glands each winter.

On admission to hospital her temperature was 102.2°; pulse 120; respiration 22, and she looked toxic. Examination showed her front teeth to be jagged and crooked; her tongue was coated; and she could not open her mouth sufficiently to allow examination of the posterior part of her mouth. She could not swallow, and talked with difficulty. The swelling in her neck seemed to conform anatomically with the thyroid gland. The region was tense, non-fluctuant and both lobes of the thyroid seemed generally enlarged. Her pulse was regular and fast and her blood pressure 122/80; her chest was normal to percussion and auscultation but her breathing was of the gasping type. There were no lymph glands palpable in the cervical region.

She presented a diagnostic problem and that evening we considered an acute thyroiditis, bearing in mind the possibility of mediastinitis. Her colour was good; she was given fluids intravenously and the next day she was able to swallow better; her condition, generally, seemed improved although the swelling in the region of the thyroid gland was more pronounced on the left side. Her blood analysis showed 4,300,000 red cells and 23,100 leucocytes.

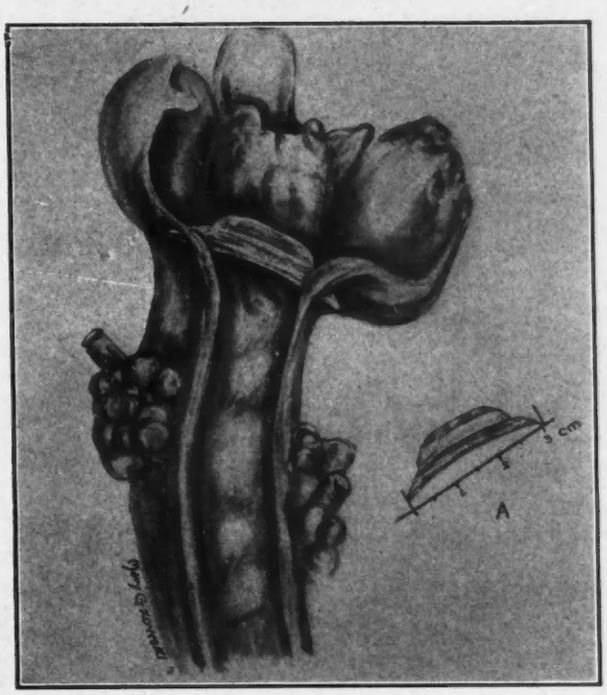

Fig. 2.—Specimen from a case of acute suppurative mediastinitis. Perforation by glass (A) at junction of pharynx and œsophagus.

Suddenly, early on March 3 (6.45 a.m.) she became cyanosed and had extreme difficulty in breathing. Her condition was somewhat better when I saw her at 8.00 a.m. and she was ordered into an oxygen tent and a consultation with otolaryngology requisitioned. After examination Dr. F. W. Shaver suspected a retropharyngeal abscess and had an immediate x-ray taken of her cervical region which showed a definite localized mediastinal abscess, with a fluid level and marked anterior displacement of the trachea (Fig. 1).

Feeling that she could not live much longer in such respiratory and circulatory distress, it was decided to drain the mediastinal abscess as an emergency procedure.

During the induction stage of cyclopropane inhalation anæsthesia, the patient's breathing ceased; low tracheotomy was quickly performed, with slight improvement. Her condition again became aggravated and an incision was then made anterior to the sternomastoid and a large abscess drained. The patient, however, succumbed. The foreign body which showed in the x-ray could easily be felt through the mediastinal wound, but under the circumstances was not then extracted. It was removed at postmortem and is shown herewith (Fig. 2).

COMMENT

Looking backwards at this case, one cannot but admit that earlier operation would have had an advantage. My feeling is that it was an

"anæsthetic" death; tilting the head backwards in an attempt to put down the tracheal tube certainly hastened her death, as her position of greatest respiratory and circulatory comfort was sitting up with the head bent forward, and I cannot but feel that her greatest chance of operative survival would have been to posture her in this position on the operating table and attempt to drain the abscess with local anæsthesia. If necessary proper exposure might have been performed later after sufficient recuperation from circulatory and respiratory embarrassment.

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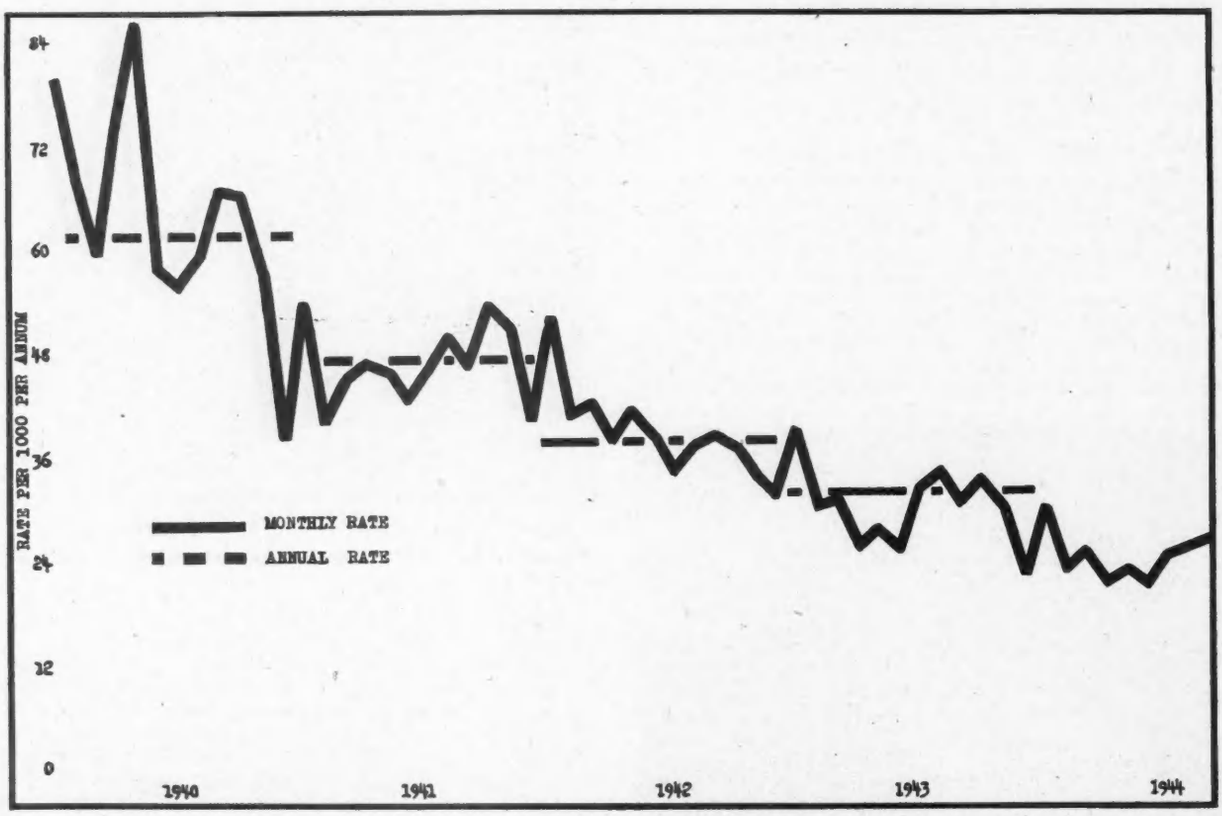
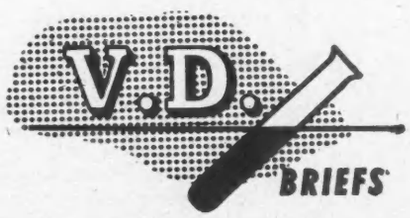
Venereal Disease Campaign

VENEREAL DISEASE IN THE CANADIAN ARMY SHOWING THE RATE PER 1,000 STRENGTH PER ANNUM FROM JANUARY 1, 1940 TO DECEMBER, 1944





"The Doctor's Puritanical State of Mind"

"Too many doctors still believe that nobody has syphilis except Negroes, prostitutes, and criminals. Their own patients, failing to fall into one of these classes, are too well born, too moral, too well educated, too well to do to be infected. Too many doctors, surprising as it seems, still think of syphilis as a disgrace, not as a disease, and hesitate to suggest the necessary steps for diagnosis lest the patient's feelings be wounded. Too many, even if they do recognize syphilis, still think of it as well-earned punishment for sin, and do less than their part in administering or arranging for proper treatment."—Dr. J. Earle Moore, Johns Hopkins Medical School.

Every Genital Sore — Possible Syphilis

The diagnosis of primary syphilis is a laboratory diagnosis, not a clinical one. Positive *darkfield examination* is conclusive. Clinical variations in primary genital lesions are great. Every genital sore should be submitted to darkfield examination. Provincial Health Departments provide specimen kits on request. Always

keep a kit available. You'll find primary syphilis when and where you least expect.

"Hooks and Barbs"

Immediately before use, draw intravenous and intramuscular needles across sterile cotton. Minute hooks and barbs, which cause pain to the patient, will catch cotton fibres. Try another needle if the one you test catches fibres. Technical excellence keeps patients under treatment longer.

"Find V.D. Contacts — Report V.D. Cases"

Clinical and Laboratory Notes

RESOLUTIONS CONCERNING ANTI-RETICULAR CYTOTOXIC SERUM ADOPTED AT THE UFA CONFERENCE IN JULY, 1942, AFTER THE PRESENTATION OF 40 REPORTS ON 2,500 CLINICAL CASES

(In Abstract)

1. Anti-reticular cytotoxic serum is recommended for all diseases in which there is weakening or inhibition of the physiological system of the connective tissue.

2. The following tests are recommended to determine the activity of the physiologic system of the connective tissue: (*a*) trypan-blue dermal test; (*b*) morphology of blood; (*c*) sedimentation rate; (*d*) titre of complement and opsonic index and phagocytic activity of leucocytes; (*e*) dermal test with anti-reticular cytotoxic serum.

3. The therapeutic value of the serum has been clearly established in the following conditions: (*a*) Frost bites and wounds, including fractures, burns and eye wounds. (*b*) Infectious diseases such as typhus, puerperal sepsis, rheumatism, pneumonia, lung abscess, tonsillitis. (*c*) Nervous system diseases such as neuritis, meningo-encephalitis, disseminated sclerosis and schizophrenia.

4. It is essential to use anti-reticular cytotoxic serum in all military and civilian hospitals for the above conditions.

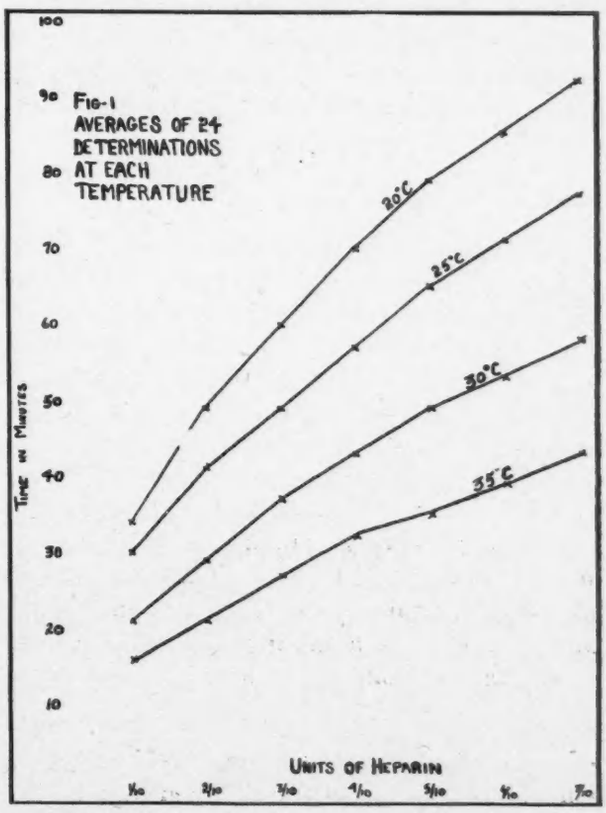
5. The serum to be prepared in the Moscow and Ufa departments of the Mechnikov Institute and in the Bashkirian Medical and Bacteriological Institute.

This abstract has been prepared by Captain Paul S. Rutherford, R.C.A.M.C., and is taken from the *American Review of Soviet Medicine*, **1**: 101, 1943.

THE EFFECT OF TEMPERATURE ON THE WAUGH AND RUDDICK TEST FOR INCREASED COAGULABILITY OF BLOOD*

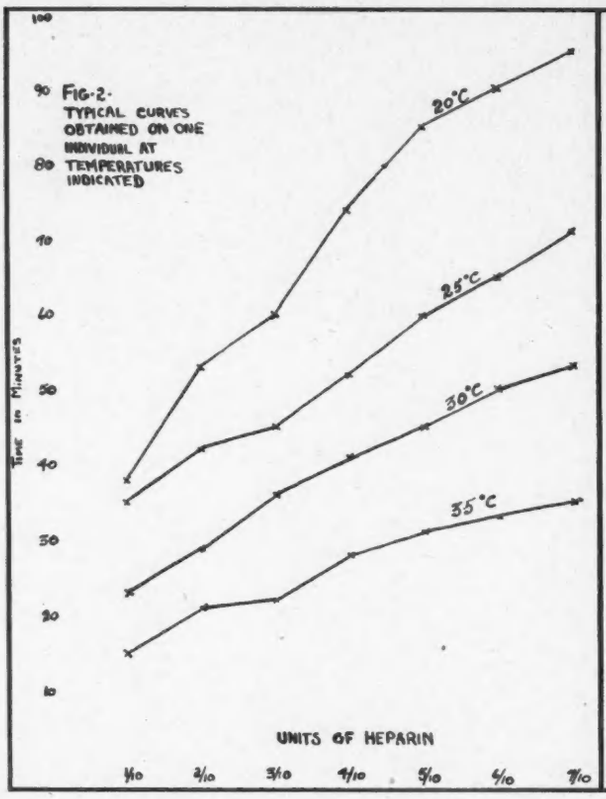
By Lieut. J. Whittaker, R.C.A.M.C.

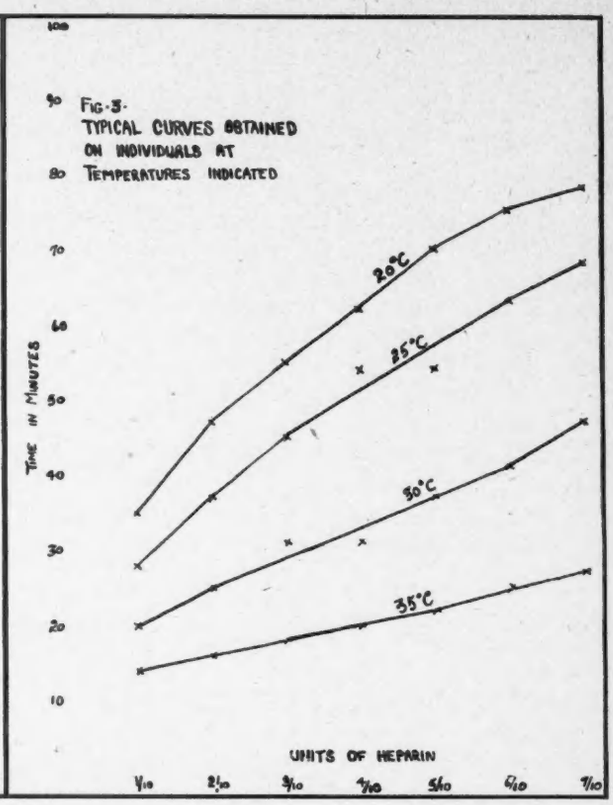
A new test by means of which it is possible to demonstrate and measure an increase in the coagulability of blood has been described recently by Waugh and Ruddick.[1] This test consists of recording the coagulation time of the blood in a series of tubes to which increasing amounts of heparin have been added. While these authors appreciated the importance of changes in temperature on the velocity of the coagulation process, the work was carried out during the winter months when the temperature of the wards and laboratory of the hospital



*From the Departments of Pathology of the Royal Victoria Hospital and of McGill University.

Aided by grant from the Associate Committee on Army Medical Research, National Research Council of Canada.





was relatively constant at 22.5° C. Under these circumstances tests were conducted satisfactorily at room temperature. With the advent of summer however, it became necessary to study the effect of temperature on the results obtained when this test is used.

METHOD

Twenty-four male patients were selected. These individuals were all under observation for mental disorders, and were considered to be in good physical health. They gave no history of syphilis and were not confined to bed. Coagulation curves using the method described by Waugh and Ruddick were carried out on each patient at controlled temperatures of 20° C., 25° C., 30° C. and 35° C. Any diurnal variation that might occur was avoided by examining the patient at the same time of day. A constant temperature bath was brought to the desired temperature, and the tubes containing the prescribed amounts of heparin were placed in the bath for thirty minutes prior to the test. One cubic centimetre of patient's blood was then added to each tube, and the test was carried out in the usual manner except that the tubes remained in the constant temperature bath throughout the test period.

RESULTS

It was found that the coagulation curve was significantly changed by variations in temperature, and that between 20° C. and 35° C. increase in temperature caused a decrease in clotting time. It was also seen that the effect of temperature on the clotting time increased steadily from tube one to tube seven.

Fig. 1 shows the mean curves for twenty-four patients at each temperature, and Figs. 2 and 3 show typical recordings for individual patients.

SUMMARY

A series of curves are presented showing the effect of temperature on the results obtained with the Waugh and Ruddick test for coagulability of the blood in normal individuals.

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1. WAUGH, T. R. AND RUDDICK, D. W.: A test for increased coagulability of the blood, *Canad. M. Ass. J.*, **50**: 547, 1944.

2. *Idem*: Studies on increased coagulability of the blood. *Canad. M. Ass. J.*, **51**: 11, 1944.

Editorials

THE GROWTH OF PREPAYMENT MEDICAL CARE ORGANIZATIONS

THERE can be little doubt that one of the main problems in the provision of medical care lies in the cost to the patient. Whether or not free medical service is a good thing in itself, (and the point is a highly contentious one) the fact remains that a large proportion of the population finds that medical care costs more than they can afford. On the other hand, no medical work should have to be done without adequate recompense.

These are the two aspects of medical care which have to be harmonized, and it is from this attempt to co-ordinate them that all the present day discussion on health insurance springs. But the matter is of more than academic interest, and it should be realized that there is a steady and rapid increase in practical methods for dealing with the economic aspect of medical care. These methods are all based on the system of prepayment, and are so termed. Whether they completely solve the economic difficulty, on the one hand, or provide the best type of medical care, on the other, we shall not now try to determine. What is certain is that they are being developed more and more, and must be reckoned with as an economic factor.

The present status of these prepayment plans in the United States and Canada is clearly set forth in a summary prepared by the Social Security Board, Washington, D.C.* This type of service is shown to have developed first for employees of certain hazardous industries, chiefly lumbering, mining and railroading. Workmen's compensation acts influenced their development indirectly since these provided compensation but not medical care. Other types of industrial medical care plans were also developed, and later still some groups of physicians operating private clinics began to furnish medical care on a prepayment basis. Yet other plans—so-called, "consumer-sponsored" —have been established under the control of fraternal organizations, unions, co-operative associations, and so on.

The latest entrants into this field have been the state and county medical societies, many of these being apparently stimulated by the establishment of medical society plans.

All these plans have the common objectives of effecting a balance between medical charges and medical services by pooling risks and costs, thus minimizing overhead expenses and assuring regular incomes for practitioners. They all aim at protecting the individual or family from the economic strain of illness.

The report is a valuable source of reference. It does not attempt to evaluate any specific plan, but it is possible from the details given to gain some idea of the amount of service each organization renders. The medical and dental personnel available under each plan, hospital facilities, medical services provided, benefits and charges, are all clearly shown.

Eleven Canadian plans are mentioned, but it is admitted that the list is not complete for this country.

As already mentioned, the report is only an assemblage of data, but it is invaluable as an indication of the trend towards prepayment medical care organizations.

*Prepayment Medical Care Organizations: Federal Security Agency, Bureau of Research and Statistics, Washington, D.C.

MOTIVATION IN MEDICINE

IT may be taken as axiomatic that good medical care requires good doctors. A perfect system of distribution of medical services would produce indifferent results if the quality of the persons supplying the services were poor. Consequently in the discussion of changes in medicine such as would happen with the advent of health insurance, perhaps the most important consideration of all is the effect of these changes on future doctors. The quality of a doctor is compounded of many things, of which intelligence, honesty, personality and motivation are perhaps the most important. It is proposed to discuss at this time motivation.

In a highly materialistic society income is a most important thing. The first question that is usually asked about a position is, not whether it is interesting or useful, but what income does it offer? This presumably re-

flects a universal desire for security, which in turn may be the result of a fairly widespread feeling of insecurity. Undoubtedly the desire for income is overdeveloped in some individuals who, in addition to security, seek power, prestige and other things which go with wealth.

It would probably be generally agreed that the strongly acquisitive type of individual is not the most desirable type for medicine and actually, although it is possible under present day conditions for some doctors to make a great deal of money, it is unlikely that many young persons enter medicine with this idea in mind. The public in general seem to regard the doctor as an altruistic sort of individual who is careless of money, who is a proverbially bad business man and who is willing to serve the public at irregular hours, in all sorts of weather and without much financial return. It is presumably this type of man that the candidate for admission to medical school hopes to be. He may become disillusioned as time goes on, but it is believed that he is directed to medicine by these ideals. Once committed to a medical career few individuals abandon it unless they are unable to meet academic requirements.

Medicine is a service profession and is recognized by the state on this basis. Originally medicine was thought of as operating solely in the field of healing the sick. In modern times another function has been added, that of preventing disease. Both of these functions are service functions, however, and since human service is the work of medicine it would seem important that the members of the profession should be imbued with a service motive. The acquisitive motive, probably necessary in a business leader in a competitive system, the desire for power and public recognition, which drives many successful politicians, are not necessarily desirable at all in medicine.

The above remarks are, of course, largely speculative and may not be true. One way of determining motivation in medicine is to ask medical students and prospective medical students the direct question. This is certainly not a perfect method, for the analysis of one's motives by oneself is difficult and perhaps always wrong, nevertheless there is some value in determining the motives which people think they possess. To secure information on this point the writer sent a questionnaire to some 200 premedical and first year medical students at McGill University. The students were instructed not to sign the questionnaire but to fill it out and return it to certain designated people. The writer did not receive any replies direct and it is believed that the anonymity of the individual was completely preserved. Unfortunately, less than half the questionnaires were returned so that proper analysis of the replies could not be made. In general, however, one could discern a trend in the answers which was confirmatory of the view that the majority of people do not enter medicine primarily to make money. Rather do they have, or think they have, a service motive.

The response of a student entering medicine to questions regarding his motivation is obviously an expression of inexperience. No doubt in later years his views would change. Nevertheless the views held at the time of entering a career are the views which determine the choice. However, if a young man says to himself "I want to become a doctor because I want to be of service to my fellows" he may be entirely sincere in his thinking but undoubtedly his thinking is conditioned by other things. For example, he will probably assume that he will be able to live in a prosperous part of the town he practises in, he will be able to marry, to operate a motor car and to send his children to college; and so income inevitably plays a part in his thinking. Certainly if a doctor were required to live in a slum and to be celibate many young men who want to serve their fellows would demur.

It is the belief of this writer that income itself should not constitute a strong attraction to the prospective doctor. A doctor, however, must take a certain place in society in order to exercise his art effectively. In any planned system of medical practice the matter of income, therefore, becomes a highly important point. How much should a doctor earn? The medical profession has dodged this question so far, but sooner or later, no matter whether payment is by fee, by capitation or by salary, the income question will have to be settled to the satisfaction of the public as a whole.

A consideration of motivation in medicine falls rather naturally into two parts. The first part deals with the motivation of the novice and the second part with that of the physician himself. It is important for the entering student to be well motivated and equally important to keep him so. There are many things in the present system of medical practice which tend to lower ideals and, unless thought is given, there could be many things in a planned system of practice which would have the same effect. One of the worst of these possibilities is exploitation of the doctor by inadequate payment, or what amounts to very much the same thing, overwork. An important argument for a change in present day conditions is the prospect of improved conditions of practice which might maintain a doctor at a high level of proficiency not possible under a free or competitive system. One has the suspicion that the majority of physicians after graduation continue their medical education largely by reading publications of commercial concerns interested in the sale of biological or pharmaceutical products. Some people think that these publications are the most important force in postgraduate education today. No one is likely to defend this situation and certainly in a planned system of medical care it should be offset by providing information more readily from less biased sources. Postgraduate courses have been suggested, but actually consideration of this matter has not been profound at present.

The medical profession is naturally interested in the quality of its membership but the public is equally so. As medical science progresses and more diseases become amenable to prevention or cure, the survival of the public from these diseases depends on good doctors. The public, of course, is not particularly interested in conditions of medical practice and is not at all unwilling to exploit the doctor. In fact it will most certainly seek to do so unless convincing arguments can be brought to bear to show that exploitation of the doctor kills the goose and stops the production of golden eggs. These would appear to be the vital considerations which the profession has to deal with when discussing the future of the practice of medicine. F.G.P.

Editorial Comments

Health Week

In an effort to awaken the citizens of Canada to the importance of good health and to the importance of becoming interested in public health problems in their own community and in the nation at large, the Health League of Canada is sponsoring a "Health Week" which opens on Sunday, February 4.

Endorsation for this project has been received by the league so far from the departments of education and health in six Provinces; from the Canadian Social Council of Canada the Canada and Newfoundland Education Association; the Canadian School Trustees' Association; the Canadian Home and School Federation.

Also, churches and numerous women's and other organizations have indicated a desire to co-operate in the extensive and ambitious planned program which will embrace "Health and Religion" on Sunday, February 4, "Health and the School" on Monday, February 5, "Health and the Home" on February 6, and "Health and Social Hygiene" on February 7.

Incidentally, February 7 is to be known as "National Social Hygiene Day", another Health-League-sponsored project which is being staged with the co-operation of the federal and provincial departments of health. The "Day" in Canada coincides with a similar observance in the United States.

Medical Economics

POSTGRADUATE TRAINING: ESTABLISHMENT OR RE-ESTABLISHMENT OF MEDICAL OFFICERS OF THE R.C.A.M.C.*

By J. Harris McPhedran, M.D., F.R.C.P.(C)

President, Canadian Medical Association

It might be said that this subject is one that concerns governments, universities and hospitals only. For several reasons I do not share this view.

1. As taxpayers, university graduates and members of hospital staffs, we should be interested. It is a matter of prime concern to all members of the Canadian Medical Association which, through the Canadian Medical Procurement and Assignment Board, has done much to assist the Royal Canadian Army Medical Corps during this war and which must continue to do much when the Medical Officers now in the army are demobilized.

2. Many present here today have sons,

*An address before the Canadian Medical Association, Manitoba Division, September, 1944.

daughters and maybe others who will be seeking undergraduate and postgraduate work as soon as possible after demobilization. Following that, they will be faced with the problem of establishment in civil life.

3. A Senior Member of our Association and a past-president wrote me just recently on his return from England that this was the chief subject of discussion among our men and women overseas.

The strength of the medical officers in the armed forces as of March 1, 1944, was 3,589; and by December 31, 1944, it is estimated that there will have been added 413 medical officers (recent graduates and interns), bringing the total to 4,002 medical officers. The questionnaire (Q4) was sent to these 3,589 medical officers in February, 1944, and up to May 20, 1944, 2,260 completed questionnaires had been received, *i.e.*, 63% of the questionnaires submitted. The summary made is based upon the first 1,800 replies received. Therefore, all estimates in regard to most of the questions asked will need to be doubled to get the over-all picture.

THE QUESTIONNAIRE

The information requested in this questionnaire is set out below:

Name..... Number.....
(surname) (block letters) (Christian names)

(1) Date of Birth..... (2) Date of Graduation..... (3) University.....

.....

(4) Nature of Work since entering Armed Forces.....

.....

.....

.....

(5) Professional Courses in the Services, if any.....

.....

..... (6) How long.....

(7) Have you ever practised..... (8) If so, where.....

(9) Type of Practice..... (10) Duration.....

(11) What were you doing just prior to entering Armed Forces.....

(12) What do you intend to do on demobilization.....

(13) Do you intend to take postgraduate work..... (14) If so, what.....

(15) Where..... (16) How long.....

Where do you want to live: (17) Province..... (18) Municipality.....

Date..... Signature.....

From a survey of the replies from the first 1,800 medical officers, the following groups were established:

Group 1A—These medical students were graduates under the program for accelerated time-tables in Canadian medical schools. Upon graduation from medical school and upon completion of eight months' internship, they were appointed to commissioned rank as medical officers in one of the three Armed Services.

Group 1B—These medical officers graduated prior to the introduction of the program for accelerated time tables in Canadian medical schools and upon graduation from medical school and completion of internship were appointed to commissioned rank as medical officers in one of the three Armed Services.

Group 2—These medical officers were taking postgraduate work at the time of enlistment and have had no experience in civilian practice.

Group 3—These medical officers have been in practice for less than 5 years prior to enlistment.

Group 4—These medical officers have been in practice from 5 to 9 years prior to enlistment.

Group 5—These medical officers were under 40 years of age with 10 or more years' experience in practice prior to enlistment.

Group 6—These medical officers were 40 or more years of age.

In brief, according to this, we have to deal with two main classes of medical officers:

(A) Recent graduates who have done no practice.

(B) Older graduates who have been in practice for varying periods of time, (5 years or less—10 years or more).

Discussion of the information obtained from these two main groups of medical officers will be confined to the more important questions asked and the replies obtained thereto.

Question 11—What were you doing just prior to entering the Armed Forces?

Class A— 783 M.O.'s—(Groups 1A, 1B, and 2)
Class B—1,017 M.O.'s—(Groups 3, 4, 5 and 6)

Questions 12 and 13—may be taken up together.

What do you intend to do on demobilization? Do you intend to take postgraduate work?

Class A (recent graduates):

672 of 783 (85.8%) want postgraduate work immediately on demobilization.

96 (12.3%) civilian practice and postgraduate work.

15 (1.9%) civilian practice.

Class B—(older graduates—groups 3, 4, 5 and 6, 1,017 in number)

538 of 1,017 (52.9%) want postgraduate work on demobilization.

327 (32.3%) want civilian practice.

152 (14.9%) want postgraduate work and civilian practice.

Thus we see that 672 Class A and 538 Class B, making a total of 1,210 (67.3%) of the first 1,800 medical officers returning questionnaires, stated that they want to take postgraduate work immediately on demobilization.

Ninety-six of Class A and 327 of Class B, making a total of 423 (23.5%) of the 1,800 replying, desire to enter civilian practice on demobilization, but they also stated their intention of taking postgraduate work at some time.

The remaining 167 (15, Class A plus 152, Class B, or 9.3% of the 1,800 replying) wish to enter civilian practice and did not suggest any postgraduate work.

Summary:—The total desiring postgraduate work at some time is 1,633, or 80.1% of all replies (1,800).

Five hundred and ninety intend to get into civilian practice immediately on demobilization.

One thousand two hundred and ten, want postgraduate work immediately after demobilization.

Question 14—If so, what? (*i.e.*, what type of postgraduate work?)

Of the 1,633 medical officers desiring postgraduate work either, immediately (1,210), or at some future time (423), the type of work wanted is as follows:

437 (26.8%) prefer surgery.

377 (23.1%) prefer medicine, and 77 (4.7%) of these specify psychiatry and neurology.

188 (11.5%) prefer obstetrics and gynæcology.

92 (5.6%) prefer eye, ear, nose and throat.

46 (2.8% *only*) prefer general postgraduate work.

The balance chose one or other of the remaining specialties.

This summary of replies is drawn from all groups, *i.e.*, recent and older graduates, but the preference percentages are about the same for these two types of graduates. Specialism seems to be the order of the day.

With this information before us as to the number, both of recent and older graduates desiring postgraduate work and the kind of postgraduate work wanted, let us look at the replies to Question 16, keeping in mind that classification of specialists is in the offing.

Question 16—How long? (*i.e.*, how long do you intend to spend in postgraduate work?)

Of these 1,633 medical officers preferring postgraduate work at some time after demobilization:

169 (10.4%) want a course up to six months.

344 (21.1%) want a course of from 6 to 12 months.

373 (22.8%) want a course of from one to two years.

232 (14.2%) want a course of from 2 to 3 years.

83 (5.1%) want a course of from 3 to 4 years.

31 (1.9%) want a course of from 4 to 5 years.

5 (0.3%) want a course of five years.

396 (24.2%) did not specify the length of postgraduate course they desire.

If it is accepted that three years is a minimum for the more restricted specialties (Eye, Ear, Nose and Throat, Gynæcology and Obstetrics, Dermatology, Pædiatrics, Radiology, etc.) and five years for Medicine and Surgery, it becomes obvious from these answers that only 119, or 7.3% of 1,633 will be able to qualify *fully* as specialists unless previous experience can apply. To these there may be added some of the 232 (14.2%) who indicated a desire to do postgraduate work up to three years. The balance of the 1,633 will obviously be classed as general practitioners and would, it seems to me, be better off in taking a general postgraduate course rather than confining their training to any one specialty. It would seem, perhaps, that they have not been advised that classification of specialists is under way and that, without certification, they may not be allowed to undertake specialist procedures, especially surgery, from which they know full well financial returns in practice are greatest.

If the situation had been fully realized I feel sure that there would have been more than 46 (2.8%) asking for *general* postgraduate work, which to my mind they should, unless they intend to spend sufficient time to be granted specialist certificates. This comment applies particularly to the recent graduates since it is from this group that the wish is expressed for the longer periods of postgraduate training and it is to this group that the classification of specialists should and no doubt will particularly apply. Moreover, if they had been asked on the questionnaire "What type of practice do you intend to pursue after graduation?" considerable light might have been thrown on what use they intend to make of the training in one or other special branch of medicine yet not of sufficient length to qualify them as specialists.

Question 15—Where do you intend to take postgraduate training?

In reply to this question, the following information is disclosed:

Of the 1,633 medical officers desiring postgraduate training either on demobilization or some time after:—

526 (32.2%) want postgraduate work in Canada.

323 (19.8%) want postgraduate work in U.S.A.

111 (6.8%) want postgraduate work in Great Britain.

673 (41.2%) did not specify.

From information received it is not likely that either Great Britain or the U.S.A. will be able to take many of these medical officers for postgraduate training, for the very obvious reason that they will have so many of their own graduates who will desire further training.

To avoid misunderstanding or confusion it seems to me that this information should be conveyed to all those seeking postgraduate training and not only this but the further fact that according to P.C. 5210 "No benefit or grant shall be paid under this Order while the discharged person is residing elsewhere than in Canada except in special cases . . .". However, the extent of these exceptions from this general rule is not clearly stated.

Of course this ruling may be modified. Should this war with Japan go on for some considerable time after the war in Europe is over the U.S. hospitals may be glad to have our young graduates to help there. There is so much uncertainty about this however, that our recent graduates should be advised now of the above quoted P.C. order.

The magnitude of the problem confronting our Canadian teaching centres and the larger non-teaching hospitals now becomes apparent. Theoretically 1,210 x 2 medical officers must be provided with postgraduate work of some kind and degree on demobilization.

Whatever may transpire between now and demobilization, there is sure to be a greater demand for postgraduate teaching not only immediately after the war but in the years to come. This is a challenge to our teaching universities and larger hospitals. If the postgraduate work being sought by these medical officers is provided, the prestige and future of Canadian medicine will have been secured. Moreover, we shall have removed from the minds of our graduates in medicine one of the chief complaints about our teaching institutions, namely, the inability to obtain from time to time either short refresher courses or adequate training in the specialties. We shall have rid ourselves of the unbecoming humility which has enslaved the minds of all of us, in the further development and amplification of the excellent but limited postgraduate instruction already being given in a few of our medical schools. Heartened by the wonderful accomplishments of our own graduates, in our own institutions, during this war, let us press forward and extend our teaching facilities so that no graduate will be compelled in the future to leave this country either for refresher courses or the more advanced and prolonged training necessary for specialization.

Certain factors may considerably alter the picture as to the numbers seeking postgraduate instructions.

1. Deaths and retirements will reduce somewhat the estimated number of medical officers in the armed forces (4,000) at the end of 1944.

2. Opinions regarding postgraduate instruction may be changed by the time of demobilization, for various reasons. Decreases may occur from: (*a*) The length of the war. (*b*) Increased financial responsibilities of the recent graduates through marriage. (*c*) The decreasing number of opportunities in general practice as demobilization progresses. (*d*) General economic conditions, the cost of starting practice and the time necessary to build up a practice not having been sufficiently considered at this time. (*e*) The difficulties which may be met in getting the desired instruction.

Increases may occur: (*a*) If the more recent graduates can feel reasonably sure of a place to settle after some time in P.G. work on demobilization. (*b*) Through increase in rehabilitation allowances since the questionnaire was sent out.

The other phase of this question that concerns each Division is: What help are we prepared to give these discharged M.O.'s in choosing places where they may practice? A revised survey of each Province should be available, showing possible localities where a practice might be developed and all information concerning this locality readily available as to transportation, hospitals, industry, educational, religious and recreational advantages.

Each local society in each Division should survey its own locality with these things in mind and consider in doing so what help can be given as a society or as individual members in establishing a colleague who signifies his intention of settling in its midst.

In return the Division should be in a position to pass on to the society or the committee that has to deal with this problem all available information of the doctor who may be considering this or that locality as a place to practice, so that his colleagues may be informed of the kind of person they may possibly have in their midst. Should he decide to stay in a given place every help should be forthcoming even though he be a competitor, to aid in his establishment or re-establishment. By doing this we shall secure them as friends and members of our association. We shall need their assistance and co-operation in the future in giving direction to and exercising certain necessary controls over the future of medicine in the Dominion.

THE WORKING OF A NATIONAL HEALTH SERVICE IN NORWAY*

By Dr. Jonn Caspersen

Deputy Director-General of the Norwegian Health Service

To make this survey on the Norwegian Health Service of more interest in the light of the present discussion on the White Paper, I will confine myself to talk about the administration of our curative medicine and the sickness insurance and to give a review of our hospital system, not mentioning our public health service or our enterprises for preventive medicine.

As there are, however, certain features in our education of doctors which have to be known to understand the Norwegian medical services, I will at first say a few words about the education of our doctors.

MEDICAL EDUCATION IN NORWAY

The population of Norway is about 3,000,000 and the total number of doctors was before the war about, 2,700, which in relation to other countries was an unusually high figure. As we had only one University in Norway, all these doctors were qualified from the same University Clinic, which meant that the standard of the doctors in Norway was more even than in larger countries.

Matriculation is usually passed at the age of 18-19 in Norway; and as the medical study usually takes 7 years, the qualification is reached at the age of 26-27. After the qualification the doctor gets his authorization from the Ministry of Social Affairs whose medical department corresponds to the British Ministry of Health. Having received his authorization the doctor may settle down as a private practitioner.

To improve their qualifications however, a large majority of the doctors apply sooner or later for a position as assistant doctors in hospitals. Having obtained such a job, he works from four months to three years or more in the hospital as a first or second assistant to the Chief Surgeon or Chief Physician. During this time he has to live in the hospital or at least spend most of his time, day and night, in the hospital. As we in Norway do not have the system of consulting or honorary doctors, but a permanent staff of hospital doctors, the junior doctors in the hospitals work all the time under the guidance of the senior and more experienced doctors, and they thus get a very good training.

While the authorization as a doctor is given by a governmental body, the authorization as a specialist is given by the Norwegian Medical Association. The conditions under which such authorization is given, are the following:

For all provinces of practice, at least one year of private practice; 4 months' hospital training in a surgical department and 4 months in a medical department. In addition to this general education, there comes from 3-4 years' training in a hospital department specializing in the particular province of medicine desired.

Whilst, however, to become a Fellow of the Royal College of Surgeons or a Member of the Royal College of Physicians it is required that the doctor undergoes certain examinations, a doctor in Norway is not submitted to any examinations to become authorized as a specialist.

The guarantee to prove that the doctor in question is qualified as a specialist is in the training which is required. In Norway much importance is attached to practical training and experience.

An ordinary practitioner as well as a specialist can, as soon as he has received his authorization, settle wherever he wishes. This liberty has its advantages, but on the other hand it means that the doctor settles in a place where he counts on making a lot of money, and this may not be the place where the need of a doctor is the greatest. From the point of view of the community it would be an advantage if the State could interfere in order to get an appropriate distribution from medical and social point of view of ordinary doctors as well as of specialists. In Norway it was before the war much desired that the State should establish such a regulation.

Most of the specialists try to get permanent employment in hospitals where they either have full time or part time work and are working the rest of the day as private specialists. Those who are employed in hospitals practically always are on a fixed salary, whether they work full day in the hospital or only part-time. In the hospitals they first and foremost treat the in-patients, but often also the out-patients. As a rule no extra fee is received for the out-patients. The fees which are paid by the out-patients go to the hospitals and not to the doctor.

I mentioned that we had a relatively large number of doctors in Norway, but as most of them are more than sufficiently occupied, we can certainly from the medical point of view still increase the number of doctors, and this may safely be done without making the economic situation for the doctors bad. The reason for that is first of all the comprehensive sickness insurance system we have in Norway.

HEALTH INSURANCE IN NORWAY

Scattered forms for sickness insurance can in Norway be traced several hundred years back. The principle of compulsory sickness insurance however was introduced in 1911. The introduction of sickness insurance in the more up to date manner about 30 years ago

*Paper read to a meeting of the International Common Room of the National Council of Social Service at 32, Gordon Square, WC.1 on Thursday, August 24, 1944.

gave occasion for some opposition partly among the population, partly among the doctors. However, the opposition did not last long, and compulsory sickness insurance has later been very popular. It appeared that introduction of sickness insurance acted as a strong stimulance for the extension of the health service. First and foremost the access for all insured to consult doctors, and to receive better hospital treatment was simplified. Also from the doctor's point of view however, it appeared that the sickness insurance had a very favourable effect. More doctors were soon able to settle down in places where it previously had been assumed that a doctor could not manage economically. In addition this new sickness insurance gave the hospitals a better and safer economical basis. The sickness insurance gradually extended. Whilst the compulsory sickness insurance at first comprised workers in public or private employment whose salary did not exceed a certain limit, access was later given for voluntary insurance to people over the age of 15 on certain stipulated specific conditions. In 1935 the fishermen were admitted to the compulsory sickness insurance and in 1936 the seamen were also admitted.

More than two-thirds of the population are covered by this arrangement, when one includes dependents, in addition to the insured *main* persons, *i.e.*, generally wife and children under 16 years of age, in some cases also parents. Of the insured about 25% are voluntary insured and the rest compulsory insured.

According to the laws now in effect the sickness insurance gives aid in cases of sickness, at births and at deaths. Medical aid is given in the form of free medical assistance or in the form of reimbursement, according to tariffs set up by the Government. As medical aid, physical treatment, tooth extractions and dental treatment essential on account of treatment of other illnesses are included. Cosmetic and conservative dental work however is not included. The sickness insurance also covers treatment by specialists. If sickness results in inability to work, disability allowances are paid up to 26 weeks out of a year, in some cases for 39 weeks for one illness. Cure and treatment in public hospitals is also given. Corresponding benefits may also be given to patients being treated in private hospitals, but if the treatment in private hospitals is more expensive the extent of the aid is generally limited to what one would have received if one had been maintained in a public hospital. In connection with births midwifery assistance and economic help is given for 2 weeks before birth and 6 weeks after. If a patient is treated in Maternity Hospital free cure and treatment is given for usually up to 8 weeks.

The sickness insurance is usually not concerned with certain diseases for which the public authorities are responsible according to special laws. That applies especially to epidemic diseases, tuberculosis and insanity. But as the public authorities usually cover expenses necessary for the preventing and treating of these diseases only to the extent necessary to safeguard public interest, that means for the epidemic diseases only as long as they are in a contagious stage, and for the insane as long as it is in the interest of the public to keep the insane isolated. The sickness insurance covers the expenses also for these diseases when they are not covered by the public authorities.

The sickness insurance law does not make any clear definition of the term "sickness" but in practice it is interpreted very broadly, so that not only ordinary illness is included, but also abnormalities that date from birth or that have occurred since. Infirmities due to old age are usually taken care of by the sickness insurance. At death a certain stipulated amount is given to cover the funeral expenses. In cases where the insured is treated in hospitals or other medical institutions, disability allowances are not given, but if the insured has got maintenance expenses, support for the family is granted. Persons employed by the State, the municipality or other public employment, and who during illness generally are given full salary for at least three months, are not granted cash benefits in cases of illness. The same is the case with fishermen and whalers. The seamen are by the insurance granted the same support as other members when the seamen are staying in Norway, but are not allowed cash benefits whilst staying outside Norway.

The expenses of the national sick insurance system before the war totalled about 65 million Norwegian kroner per year, of which about 18 million went to hospital expenses, about 15 million to doctors' fees, about 12 million to disability allowances, 3 million to transport, 2 million to physiotherapy, 2.5 million to expenses in connection with childbirth, and 1.5 million to dentists' fees. The administration cost was 4 Norwegian kroner per member per year.

I have now explained what kind of service the insurance scheme renders to the insured and I will finish this by stressing the rather important point that *free choice of doctor is given to the insured.* There are a few exceptions which I will explain.

If a person for instance gets bronchitis one day, he may consult one doctor and if he the next day fractures his leg he may go to another doctor, just as he pleases, and the sickness insurance will pay both doctors. He cannot however, for reasons which are easily understood go to one doctor one day and to another the next day for the same disease, except when the first doctor gives the patient a written recommendation for consulting another doctor—for instance a specialist.

Speaking of specialists I have to mention that the sickness insurance does not pay the higher fees of the specialist if the insured con-

sults the specialist direct. In that case only ordinary fees are refunded. If the insured however is recommended by an ordinary practitioner to see a specialist, the higher fee of the specialist is paid by the insurance scheme.

As the ordinary private practitioner does not like to deny a patient to see a specialist when the insured wishes it, or when he thinks it advisable, the insured usually always gets the specialist treatment he needs and gets the fees refunded by the sickness insurance.

There is one more restriction in the free choice of doctor I have to mention. In remote parts of the country where there is only one doctor, the insured more or less are bound to consult that doctor, as the sickness insurance would not pay the extra travelling expenses to the more distant doctor. If, however, a patient living in such a remote part of the country really needs treatment by a specialist or treatment in hospital with special facilities, the sickness insurance pays the necessary travelling expenses—even if the insured has to travel from the northernmost point in Norway to Oslo, a journey which takes him about a week. In such cases the sickness insurance even often pays the travelling expenses for a person to accompany the patient if that is necessary.

Many of you would perhaps find it difficult to understand a scheme which is so liberal, and you would perhaps think that a doctor living in such a remote place, where he has no competition from other doctors would be tempted to misuse the scheme to become popular in his district and would become so keen to please his patients when they want to see a well-known doctor in the capital that the local sickness insurance system would be ruined. When this is not the case it is because the doctor who is practising as the only doctor in his district usually is more community-minded than others and because he very well knows that it is in his own interest that the insurance system is kept up and works smoothly.

ADMINISTRATION

Let me then give some details on the financial background of the National Sickness Insurance system and how it is administered, including the relationship between the insurance scheme on one side and the hospitals and the doctors on the other side.

Health insurance is built upon local institutions, the so-called "Insurance Offices", of which there is one in each of the country's 750 municipalities. Each Insurance Office has a board consisting of five members, with five deputies, chosen by the municipa' government from members of the compulsory insurance plan and from such employers (3 to 1 respectively) and one member of the board is a free choice. The board is appointed for three years, and chooses its own chairman and vice-chairman. According to the law the board shall supervise the work of the Insurance Office, invest its funds, and represent the Office when required. In other words, it is a democratic board made up of representatives of the people's choice.

The office is managed by a paid accountant, employed by the municipal government when the wishes of the board have been heard and when the appointment has been approved by the central authority, the National Insurance Office. The larger Insurance Offices require a whole staff of employees, besides the public accountant.

The law provides also that in each municipality there must be a "Board of Appeal". This board shall consist of three members. Decisions which have been made by the Insurance Office can here be appealed. The Board of Appeal's judgment can be brought before the National Insurance Office. If a controversy arises between an Insurance Office and a doctor, such disagreement may be brought before a litigation board for the whole country. Such a central litigation board is appointed by the King, and has three members who are appointed for a three-year period. The chairman must be a lawyer and the other two shall be a doctor and a representative of the Insurance Offices. The decisions of this Committee are final.

Some of the larger Insurance Offices found out early that physical treatment such as sunray lamps, diathermy, massage, baths, etc., could be given more cheaply if the Insurance Offices established their own physical institute. The larger Offices also employ permanent medical supervisors, who control the patients and assure that no one misuses access to free medical attention, and that the physicians who treat the insured patients do not do so to their own benefit.

The central authority for the Insurance Offices is the National Insurance Office, one of the technical subdivisions of the Ministry of Social Welfare. As occurs in the case of other technical departments of this kind, the National Insurance Office can make final decisions in some instances, while others are sent on to the Ministry itself. The National Insurance Office supervises the work of the Insurance Offices and the carrying out of the health insurance law in general. A decision in the case of a dispute is final and applicable to the Insurance Offices.

The gradual expansion of the health insurance law has created an elaborate network of laws and regulations. Among other things, so that all Insurance Offices may be familiar with new developments in the law, so-called county associations of Insurance Offices have been organized and these in turn are joined together and make up the National Association of Insurance Offices, with a board of seven members. This National Association arranges conventions once every three years, where questions of law amendments, contracts and new suggestions etc., are discussed. The necessary income for

the sickness insurance is secured in the following way:

For persons compulsorily insured premiums are paid in 6 classes according to their income. The insured pay 60% of the premium, the State 20%, the Municipality 10% and the employer 10%. The insured pays his part of the premium weekly or monthly when the premium is deducted from his wages or salary and paid in to the local insurance board by the employer together with his part.

The same applies to those who are voluntarily insured, with the exception that the employer does not pay part of the premium, so that these insured have to pay 70% of the premium themselves. This also applies to the fishermen.

PAYMENT OF DOCTORS

As mentioned before the insured have free choice of doctor and there is accordingly no limit to the number of doctors who can practice for the insurance scheme, and there is no limit to the number of patients a doctor may have. The doctor is paid for each consultation and not per patient as in the British Panel System. Arrangements between the doctors and the Insurance Offices are based on mutual agreement usually made locally between the various local organizations of doctors and the local Insurance Offices. According to these agreements the doctors send to the local Insurance Office at the end of the month a list of patients treated, with details as to the number of consultations or calls made to each patient, travelling expenses and so on. The local Insurance Office then pays the doctor according to the agreed tariff.

The doctor is thus paid according to the amount of work he has had. If the patient has had any special examinations, for instance, blood-samples are taken or microscopic examinations are performed, or special treatment as with physical apparatus, intravenous injections and so on, the doctor gets extra pay for these examinations or treatments according to the agreed tariff.

This system is in Norway called the contract system because it is based on a contract between the doctor and the Insurance Office. This contract system which is the commonly used one in Norway, keeps the patient entirely out of the picture as far as the pay is concerned. He thus does not need to worry about the financial side.

We have however also another kind of system which is practised in some places especially in some of the larger towns where full agreement between doctors and Insurance Offices has not been reached as to the amount of charges. In these cases the so-called "reimbursement system" is practised. This system entails that the insured has to pay the doctor himself and afterwards receives a refund from the Insurance Office, according to a tariff fixed by this Office. That means that the insured may have to pay a higher fee than is refunded to him.

The difference between the two systems is however not very great, as the doctor often, and especially when the patients are indigent, does not charge more than he knows the insured will get refunded from the Insurance Office.

HEALTH INSURANCE AND THE HOSPITALS

Before mentioning the relationship between the hospitals and the sickness insurance scheme, I find it necessary to say a few words on the Norwegian hospital system as a whole.

During the last few decades before the war the Norwegian hospital system had been undergoing a rapid development. In 1937 Norway had 391 hospitals with a total of 26,000 beds, which corresponds to one hospitals bed for every 115 inhabitants. Of these beds about 7,000 were for insane, epileptics or feeble-minded; 6,000 for victims of tuberculosis; and about 13,000 for other diseases.

Many of the hospitals were small, the reasons for this being geographical conditions. Emphasis was placed on developing the hospital system in such a way that the small local hospitals could with ease transfer their more complicated cases to so-called "central hospitals", that is, general hospitals equipped with as many different specialists as possible and with the all-round medical apparatus for diagnosis and treatment as is required by modern clinical and medical science.

Most of the hospitals are publicly owned and operated,—either by the State, the municipality or the province. Of the hospital beds listed in 1937, more than 80% were in public hospitals. The few private hospitals are for the most part conducted by voluntary health organizations, and a large part of the income needed for their operation is derived from public or semi-public sources (the health insurance system). All hospitals are subject to the supervision of health authorities. A system for non-paying patients is not to be found in Norwegian hospitals. The patient's expenses are paid either by the patient himself, by the health insurance, or by the public according to prescribed rule.

The idea of being more or less dependent on charity organizations when ill is therefore strange to the Norwegians. They know that when they are ill they have to pay themselves, or that the sickness insurance to which they have paid their premium settles the account for them. They also know, that they will be treated in the public hospitals where they get the best treatment obtainable and where there is only one kind of accommodation. I would like to add that people have complete confidence in these public hospitals, which are usually preferred by rich and poor alike to the private nursing homes.

The very few private hospitals or voluntary hospitals we have in Norway are usually small

and cannot therefore be so well equipped with all modern facilities and specially trained personnel as the public ones. These private or voluntary hospitals may give more privacy and luxury. The public hospitals, because of their better and more modern equipment, their fixed medical staff and better facilities however enjoy a greater confidence. To stress this point I may say that doctors when becoming ill themselves usually prefer the public hospitals.

The democratic principle that the millionaire as well as the poorest man go to the same hospitals and get the same treatment works very well and the principle is in our opinion justified because a poor man when ill needs just as well as the rich the best medical treatment.

As regards payment for the maintenance in hospitals, most of them charge the same price per day per patient and this charge includes usually everything. There is therefore no extra fee for the doctors, operating theatre, narcosis and so on. Hospitals run by the municipalities or provinces however often charge a slightly higher price per day for patients from other municipalities or provinces.

When a person is in need of immediate hospital treatment the doctor gives a certificate stating this fact, and the patient is admitted without any further formalities. The hospital knows that if the patient is not insured, he pays himself, or if he is not able to do so, the municipality will pay for him. If the admission to hospital does not need to take place immediately, the patient after having received the doctor's certificate has to get a guarantee from the sickness insurance office beforehand.

HEALTH LEGISLATION IN SASKATCHEWAN

BILL 58—AN ACT respecting the Provision of Health Services.

1. This Act may be cited as The Health Services Act, 1944.

2. In this Act, the expression:

(1) "commission" means The Health Services Planning Commission created by this Act;

(2) "department" means the Department of Public Health;

(3) "health region" means a health region established by the minister under the authority of this Act;

(4) "health services" means services provided by any hospital, and medical services;

(5) "hospital" means a hospital receiving aid from the province and includes any nursing home or institution approved by the minister;

(6) "medical services" means services provided by a licensed medical practitioner or dentist, a registered nurse or any other qualified person, and includes drugs, appliances and treatment prescribed by such medical practitioner or dentist or other qualified person;

(7) "minister" means the Minister of Public Health;

(8) "municipality" means a city, town, village or rural municipality.

3. Subject to the regulations, the department may:

(*a*) pay part or the whole of the cost of providing health services for such persons or such class or classes of persons as may be designated by the Lieutenant-Governor in Council;

(*b*) make grants or subsidies to municipalities, hospital boards and health regions, or any of them, for the provision and operation of health services; and

(*c*) pay part or the whole of the cost of providing health services in any health region or part of a health region in which such services are deemed by the minister to be required.

4. The minister may divide the Province into health regions for the administration of The Public Health Act and of health services under this Act.

5. (1) There shall be a commission to be known as the Health Services Planning Commission, and the members of the commission shall be appointed by the Lieutenant Governor in Council.

(2) A majority of the members shall constitute a quorum for the transaction of business, and during a vacancy the remaining member or members may exercise all the powers of the commission.

(3) Any one member may hold an inquiry or conduct a hearing for the commission.

(4) There may be appointed from time to time a secretary to the commission and such other officers, nurses, technical experts, clerks and assistants as may be required.

(5) The members of the commission and officials shall receive such remuneration as the Lieutenant Governor in Council may determine.

6. The Commission shall:

(*a*) determine the costs of providing for health services with respect to which recommendations are received by the minister, and recommend to the minister ways and means of financing these services;

(*b*) outline proposed boundaries of health regions in consultation with other departments of the Government;

(*c*) work out in detail the needs of one or more health regions, to determine the health services required to satisfy the needs of regions and the costs of such services;

(*d*) make an inventory of municipalities and local improvement districts which have not adequate health services and recom-

mend to the minister what action should be taken to provide better health services therein;

(*e*) plan a scheme of compulsory health insurance for the population of one or more urban centres;

(*f*) assist the Government in planning health services from time to time under the consideration of the Government;

(*g*) recommend to the minister qualified young medical graduates for postgraduate training in advanced obstetrics and public health;

(*h*) recommend to the minister qualified registered nurses for postgraduate training in advanced obstetrics and public health;

(*i*) make recommendations to the minister respecting extension of the faculty of medicine at the University of Saskatchewan and the provision of adequate clinical facilities for teaching purposes.

7. (1) The minister may appoint an advisory committee to the commission consisting of such persons as he deems best able to advise the commission with reference to any plans under consideration.

(2) The committee shall meet on the call of the commission and the members of the committee shall be paid such per diem allowance and travelling expenses as may be determined by the Lieutenant Governor in Council, for attendance at any meeting called by the commission.

8. The minister may, if he deems it advisable to do so, provide for the taking of a poll in any health region or part of a region upon a health services scheme, and may pay the costs of taking a poll out of moneys appropriated by the Legislature for health services.

9. Expenditures incurred for the purposes of this Act shall be chargeable to and payable out of moneys appropriated by the Legislature for health services.

10. The Lieutenant Governor in Council may make regulations:

(*a*) governing the provision of health services for which the department is by this Act authorized to pay and prescribing the conditions on which payments may be made by the department for health services;

(*b*) prescribing the conditions on which grants or subsidies authorized by this Act may be made by the department;

(*c*) prescribing the conditions on which the department may pay any part or the whole of the cost of providing health services in any health region or part of a health region;

(*d*) prescribing the amount, if any, not exceeding $10 per annum, to be paid by or on behalf of each resident of any health region or part of a health region in respect of health services provided therein; and prescribing the maximum amount payable in respect of any one family;

(*e*) providing for payment, collection and recovery of amounts payable pursuant to any regulation made under the authority of clause (*d*), in the same manner, as nearly as may be, as is provided by The Municipal Medical and Hospital Services Act with respect to payment, collection and recovery of the tax payable pursuant to that Act;

(*f*) generally for the purpose of carrying out the provisions of this Act.

BILL 67—AN ACT to amend The Public Health Act.

This repeals sections 13 to 26 and provides instead for Full Time Health Regions to be set up in the province—

13. The minister may prepare a scheme for providing full time health services in any health region established pursuant to The Health Services Act, 1944.

14. (1) The scheme shall provide for the appointment of a medical and sanitary staff consisting of a duly qualified medical practitioner, one or more sanitary officers, one or more trained nurses and other necessary qualified personnel, and for the appointment of a secretary and other necessary clerical staff, all of whom shall devote their whole time to the promotion of the health and sanitation of the region.

(2) The scheme shall also provide an estimate of the expense involved and state what portion is to be paid by the region.

15. The minister may, after consultation with the local governing authorities in the region, apportion the part of the costs of the scheme to be paid by each rural municipality, or each rural municipality and local improvement district, or each local improvement district included in the region.

16. The minister may thereupon declare the region to be a full time health region, designating it by name or number, and the scheme shall thereupon be binding upon each municipality, or each municipality and local improvement district, or each local improvement district in the region.

17. Each municipality and local improvement district in the region shall levy and transmit to the Provincial Treasurer annually the sum allocated by the minister as its share of the expense.

18. Notice of the constitution of a region as a full time health region shall be published in *The Saskatchewan Gazette* and such notice shall be conclusive evidence of the constitution of the region and that all the necessary formalities have been complied with.

19. (1) The members of the staff in each region shall be appointed by the Lieutenant Governor in Council, be paid such

salaries and allowances as may be deemed proper and shall be under the control and direction of the minister.

(2) When an employee of the department becomes a member of the staff of a full time health region he shall, while so engaged, be deemed to continue to be an employee of the department.

Men and Books

THE DOCTOR'S OWN ETHICS

By James B. McClinton, M.B., B.Sc.Med.

Timmins, Ont.

The ant in the pants of society is ethics. It is a most disquieting term.

The Encyclopædia Britannica prints thirty thousand words about it, for ethics is an old study. It was mused upon before the blue Portland vase was pressed by potter's hand fifty centuries ago.

It has worried the writer since a side-burned Victorian lectured the graduates. He seemed to think that ethical conduct meant a knowledge of the classics.

Theological students study ethics for four years. They rarely mention it after. Medical students have one lecture and talk about its absence for forty years. One of another profession had a code of ethics in his trunk under his dinner jacket. He hadn't seen either since graduation and "didn't think it would fit".

The code of a law society designates that a member must be "in fact as well as in name a gentleman". One hundred and four ladies were lawyers that year in Ontario.

Big business hinted that ethics was frowned upon by rugged individualism. One couldn't be sensitive to others in competition. Strange that hard men do the loveliest things when old and a little senile. Then they endow hospitals and buy toys for little children.

Nurses have the longest code for the shortest time. Shortly after they have graduated and lost their arches, they marry. Their code mentions fifty-three accomplishments. It extols the joys of chastity but never whispers about beauty without which what a dull world.

The Canadian Medical Association has a code. Its little blue book, 9.8 cm. x 14.6 cm., is lighter than a liquor permit. It is small enough to lose, flimsy so that it falls apart, and dull enough to be forgotten.

By this code the practitioner must learn to *retire*. He must *retire* to the next case if the family physician is near and to the next room for consultation. After *locum tenens* he must *retire* in a hurry with the next train. If the patient looks at the doctor and calls someone else he should *retire* home to bed.

This retiring is so emphasized that he might well be given a course in walking backward before graduating.

The tiny manual only tells that no one can delineate ethics any more than describe pain. Pain that hustles the farmer from the loft, the mother from the broom.

Textbooks say that a pain may be sharp as a rapier, but how many have been rapierized? Or gnawing, but who knows what it is like to be gnawed? To lie on mossy earth midst mottled shadows and hear a beaver gnaw, suggests no pain.

No Royal Fellow can tell what pain is. They tell where it is and whither it goes and how much, but not what.

So is Ethics. We write its rules but don't know what it is.

CONSULTATIONS

In the blue book are rules for entering a room for consultation. It warns, "On entering the room the attending physician should precede the consultant". Dickens, in *Dombey and Son* shifted them about. He had the physician open the door for the great consultant. But how do the rest go in? Perhaps the nurse with the tilted white cap should trot in first. Then the last wife of the patient. Then the doctors.

If a strange doctor is coming out everyone is embarrassed. The family physician scorches the wife with a burning look and charges more. Besides he couldn't get there any sooner. He was so busy. Doctors talk about being *so busy*. Except those who are really busy and they talk about the most cultured and interesting things. The mind that grazes clean soon gambols into other pastures.

If a lawyer is fussing about, all look painfully down and think of money. Once a patient of mine asked for a lawyer as soon as she knew I purposed operating. Then she appointed another lawyer to mind her affairs. She told him "I'd like some other lawyer when I'm gone for I know you so well".

If a clergyman fills the door, all back up and think of Heaven. The number going in and out depends on the patient's kindliness . . . and current account.

Then in they go and the door is closed.

WHERE CONSULT

It reads, "The physician should discuss the case in private". If they move over to the corner of the room he might hear whether he may live or not and how much they'll charge. So they must go out. But the living room is full with the other professions and those who loved him and those who love a legacy. The room, rarely soundproof, but brooking no intrusion, is the bathroom. A Toronto surgeon often consulted there. While the very general practitioner sat on the bath tub and turned on little squirts of hot and cold water, the great

man sat elsewhere and leaned forward. A satisfied look would illuminate his face and he'd say, "Doctor, your patient is ill. He reminds me of a belly in Brockville." He never remembered a face, but once a nightgown was gently raised up and a sheet with difficulty pushed down, he'd say, "Ah, there is a belly of mine". His incision had a little twist at the umbilicus as Millet might sign a masterpiece.

WHERE TO REST

No paragraph tells us where to sit when in. The late distinguished Dr. McPhedran once lectured us on *sitting on the bed.* He affirmed its indignity, discourtesy . . and besides once the bed frame fell and he nearly broke his neck.

Many like the mattress. It is restful and there the cold Harley Street dignity slinks away.

WHAT TO SAY

The sad brochure tells us when there must be a consultation, *i.e.*, if the patient may not live, or never be born, or has swallowed poison, but it doesn't suggest what the doctor should say. One lady learned through the keyhole about her husband. She saw the striped pants specialist nod to her doctor with the hanging cigarette. She heard them whisper about poker chips and princes and prices of stock, and the colour of lips and the shape of limbs. She pressed her ear so close when they wondered why the oldest boy didn't look like his father. They mentioned the sextette from Lucia and where the trout take flies. The first subject was when the next train would leave.

Her mouth puckered when the specialist rose and said, "This old lad is going to die, don't worry your head about him". Then there was a new doctor.

Often they talk of war. Since the turn of the century thirteen years of war. The great Banting talked of red splashes across the canvas, and Kelly, the gynæcologist, spoke gently of Galilee.

SPLITTING FEES

With a touch of old world sofas and most proper English the code whispers of secret commissions. An American code calls it fee splitting and they say it's bad.

It comes from the doctor in the smelly cutter with his feet on a bag of warm oats. He brought the patient into the world and might see him out. He would *feel* the abdomen often and the surgeon would *palpate* it once. He rarely was paid while the consultant got a hundred. That night the surgeon might snug himself in a cab to the "Merry Widow" while the old doctor would drive the drifting concession, probably to some incontinent bachelor. It wasn't fair, so the surgeon would slip the doctor a few dollars.

There is no fee splitting in the second operation. The patient is older, poorer, suspicious and has often the same pain.

The fee should be according to the means. A conjoined fee must be stated to the patient without secrecy. If it is charity do it kindly. Bach was poor. Lister was often penniless, and soldiers shook dice for the Great Physician's garments which was all He had.

STEALING PATIENTS

Jacob wore hairy gloves and stole his birthright. Leah stole Jacob. Napoleon stripped Europe of treasures. Hitler has left bare walls in many an old world museum. The Bayeux frieze no longer hangs on the wall to portray the days of William the Conqueror. No one knows where it is except the rogues who stole it. And doctors steal patients.

Doctors attract patients by personality, efficiency and subterfuge. Many physicians study their patients well after they've gone into the office round the corner. The painful twinges are not from the loss of a patient but from the paralyzing thought "Maybe that doctor is better than I am".

Of course there is the castigator who maligns the last physician. One Ottawa physician would patter in and hurl the mixtures and salves of the last doctor out of the window. Once later, when forgetful and shortsighted he threw his own bottles out. The tut-tutter shakes his head, "I wouldn't mention my colleague but if you had only called me first".

The sly socialite tells his pregnant partner after she has bid no trump with two cards that his cases are shorter and easier even if the patient is older, the pressure higher and the pelvis narrower.

It is the duty of the patient to stay with her doctor as long as the treatment is satisfactory and the fee reasonable. The doctor will likely attend as long as the fee is satisfactory and the treatment reasonable.

THE FAMILY PHYSICIAN

The family physician is gone. Even Grandma calls the greying Brummel who holds her dry brown hands and tells her that time has only touched the rose in her cheek. And the daughter likes the tall dark doctor whose tie matches his socks. Uncle Tom wants the chap with the iodine fingers and wiggling ear who sits in lodge with him. Dad likes efficiency. He must have the snap diagnostician who knows uræmia by the smell and turbinates by the snort. Mother doesn't want anyone and no one knows how tired she is. Perhaps she's told to "take care of herself" as the kids scurry off to the dance. Most middle aged women tragedies can be prevented and she is needed then with sympathy and quiet authority.

The doctor must remember that the petty idiosyncrasies of life repeat with certainty. The familiar become contemptuous. The wealthy arrogant. The poor discouraged. He should not take too seriously the shilly shally wanderings of the patient. They'll visit the rubbers,

the twisters and invocators and when the darkest shadow falls they'll come back. If he's been honest.

THE MOMENT EMERGENT

If several doctors arrive at an accident the first in must be the last out. However he must *withdraw* himself and his pills if the breathless family physician has come . . . or if the patient doesn't want him . . . or if he feels incompetent . . . or if the sick one has recovered, for it is quackery to treat a well patient very long. Well patients should be only advised or inoculated. The well patient is the basis for all preventive medicine. It is not unethical to treat a well patient to prevent an illness. It is unethical to treat such a patient for an illness that does not or has ceased to exist.

THE DOCTORS DIFFER

If doctors have differences of opinion according to page two they must refer to the local committee on ethics (who may be at a hockey game). They must write their complaints before one of them takes a pulse again. The patient may expire in the meantime. The laity say *pass away*. *Pass*, according to Oxford, means satisfy the examiners, and *away* just means distant, like beyond the fringed hilltops of life . . . but not sure where. If the lapse is temporary they say *pass out*. That is hardly correct for it suggests the cup of controversy . . . or two cups. In such tragedies the doctor will swear that "everything was done" and he'll mutter "Too bad I couldn't have been there sooner" . . . "such a fine chap" . . . "Dear, dear" . . . "Was it a man or woman?" . . . "I must be more observant" and he walks slowly out of the court to display charity rather than truth, until he fades away.

The manual murmurs about a golden rule . . . when differences occur. Perhaps that strange urge that lulls men into silence rather than spurn his fellow . . . or loosen his tongue to a fellow's virtue that will tell the doctor what to do.

TRUTH SOME TIME

He must tell the truth some time. A business man had pain. It ran down his arm and "he'd get so puffy". The young doctor took four pages of history, for his university had taught him to take a heart history but nothing about heart misery. He told the man he had serious trouble and "it would be a matter of months". The man swayed out. He must not smoke nor take the tiniest drink nor sit at the front of a ballet. He must immobilize life.

On the wooden steps he didn't see the lass with the blue scarf and he always waved at a pretty girl. He gave his poker chips to the shoemaker who muttered, as his gnarled fingers clasped the last, "that man sure is sick".

He went to church. He didn't hear the sermon but told the minister it was fine. First time in twenty years he and his competitor shook hands without watching each other.

"But young Doc. might be wrong", he thought, so he hied to a specialist who electrocardiogrammed him to see the humps of the old organ. The cardiologist asked "Have you enjoyed life?" and the man said "Yes" . . . "Well" the doctor said, "there's nothing the matter with you."

The man forgot his bill. As he hurried past the switchboard the girl asked (the one with the hair like the buckwheat stubble) "did you find your doctor?" and the old lad kissed her. "You old fool" she chittered . . . but he never heard . . . He was far out . . . and her voice was caught over tangled wires, maybe in New York where no one likes to be called an old fool, however true.

Three months later, down main street he smiled at the high flaky clouds and knew nothing about low T waves. He stopped to buy a squeaky elephant for a wee girl with polio. He dropped in on a lady who was very old and had no business giving him the snifter of blueberry wine . . . when they picked him up.

Yes, both doctors diagnosed but one remembered that life should be sweet and long . . . and long.

CRIMINAL INTERFERENCE

Life is parasitic. The wolverine eats the porcupine. The bear chases the moose calf. Large nations obliterate the small with cartels . . . and guns. Even the unborn child does not escape. It is the prey of the criminal abortionist. The abortionist stains the canvas of medicine. He lurches with eyes shifty as a weasel's. He throws a murky shadow on humanity's long white wall.

Man can descend no lower than the disregard of life. The snuffing out of a kidnapped babe and the destruction of a child not yet born are one. The same wee lips. The same wrinkled forehead. The same big toe.

Perhaps the little visitor shouldn't come where competition bites. Most certainly the congenital idiot shouldn't. Nor the familial amaurotic idiot. Nor the hydrocephalic. Nor the hereditary insane.

And the icy hand of poverty often closes the door. Unemployment, want and worry seem to be normal in this hectic world, and some babes are not wanted because society says so. The shrug of the shoulder and the sly whisper are hard for a girl who loved too well but not according to law.

And why should 4% of Canadian children who chuckle for fun meet a smirk of scorn because they are illegitimate . . . Like Leonardo da Vinci.

No doctor should perform a therapeutic abortion without three consultations with written copies in each office and in the hospital. There should be written consent of the patient in question.

No doctor should give the tiniest wink to criminal abortion . . . that stain is indelible.

DEATH BED STATEMENTS

According to British courts a patient only tells the truth when she is sure she is on the brink. They call it *settled expectation of death.*

If she does tell the truth he may be surprised for she hasn't always. And few tell all the truth. She'd tell of headaches when she meant heartaches and complain of her stomach when the trouble was a boy overseas.

And in serious criminal illnesses, if the physician did what the wigged gentlemen say, he'd lean over the bed with a white paper and smilingly assure the patient that she's a gonner . . . but it's all right, for everything was done . . . and would she confess?

And he's supposed to listen and tell to all the court.

And she is at the end. And it looks so dark and misty with nothing near but loneliness and shame. She tries to lift a hand that cannot raise the sheet. The doctor takes her blue cold fingers. Perhaps she'll give a feeble press before her childlike head drops quietly and her pulse is felt no more.

Oh, no, he has never told and he never will. He won't hurl down the delicate urn called confidence to crash among the bricks of legal bickering.

THE LONG SHADOWS

The dinner was well appointed and it was at seven. Restless beams from the candelabra played hide and seek through the rose goblets. They danced off English silver. They brushed the Spode tureen.

The guest was quite at home. He lifted his soup as nonchalantly as he won scholastic laurels, years before. He never told that he could wear the professor's gown at the faculty. Nor that he once carried the gold headed cane for the best athlete. His high rank in the World War I was just routine.

He left his knife parallel to his fork. His spoon lay beside his cup. He addressed a clinical meeting later in a most scholarly manner. That was fifteen years before his last coronary.

He must have bequeathed something, for his two lads were like him. One, a research fellow, reached his white-sleeved arm too far and the animal bit him. Polio viruses are small, not understood and virulent. The boy was so young to be so still and white.

The other was ship's surgeon. The torpedo left only the stern. He stayed till all were off. He gave morphia and left some crimson drops along the deck. The stern dipped down and the water met him cold. He swam to a raft and reached one arm up . . . but let go. He turned once more and grasped the edge . . . a depth charge hurled him away. He worked slowly back and climbed again but the raft tipped. Seven times in all he tried . . . and then a large grey sea closed over.

And now the silvery shoals of porpoise leap. And winged gulls descend. And flimsy tufts of mist float down, to kiss the grey green waves. Or sometimes skipping whirl-winds purl the sea and white caps break . . . While far below he sleeps and far above a finger moves . . . to write his name in immortality.

Because he was ethical.

DR. LYMAN G. BARTON, SR.

By Harold N. Segall, M.D.

Montreal

Dr. Lyman Guy Barton, Sr., of Plattsburgh, N.Y., was a familiar figure in Montreal hospitals, and in recent years particularly at the Montreal Neurological Institute. With his death on November 21, 1944, a great general practitioner of the old school has left us, but, if immortality be reckoned by the results of good work, then he will remain one of the immortals. In addition to the many good things that a physician does in the course of fifty-three years of active medical, surgical and obstetrical practice, and also as a radiologist, Dr. Barton exercised his inventive genius for the improvement of mechanical instruments which contributed to the reduction of morbidity and mortality in obstetrics and orthopædics. He also developed instruments which greatly facilitate the work of neuro-surgeons. He not only saved lives himself, but has helped other physicians to do so during his own lifetime and for ever in the future. Perhaps his outstanding achievement was the invention of the Barton obstetrical forceps.

Dr. Barton died only six weeks after the death of his beloved wife. His own illness began a few days before her death and during the course of this illness he repeatedly complained of his intense loneliness for her. Those who knew Dr. and Mrs. Barton at all well and had seen their life at home could readily understand this. They were married while he was a student at Cornell University. When, in 1891, he took over his father's medical and surgical practice in Willsboro, New York, Mrs. Barton, who had not had any medical or nursing training, was his sole assistant at major surgical operations performed in his own home or in those of his patients during the first twenty-three years of practice. Dr. and Mrs. Barton are survived by two sons, Lyman G. Barton, Jr., and Philip B. Barton, one daughter, Mrs. Frank Dossert, six grandchildren and two great-grandchildren.

The Barton tradition of medical practice in the State of New York began when his grandfather, Dr. Lyman Barton (1812-1899) started the practice of medicine in Willsboro, in 1839. He raised a family of five daughters and one

son, the late Dr. Lyman Guy Barton, Sr., (1866-1944) was his youngest child. At first the latter chose to study mechanical engineering and for three years pursued this course at Cornell University. Then he acceded to his father's request, and soon after he married he studied medicine and graduated from the Bellevue Hospital Medical College in 1891. When he came home to Willsboro his father immediately retired at the age of 82 and his son took over the practice. Thus the late Dr. Lyman G. Barton, Sr., who pioneered advances in medicine and surgery in the region where he worked and contributed to progress by his inventive genius and mechanical skill, became an intimate part of this golden half-century of achievement in medical science. His two sons, Lyman G. Barton, Jr., and Dr. Philip B. Barton, practice in Plattsburgh, N.Y.; the latter's son, Fred W. Barton, is now a freshman student in the Faculty of Medicine at McGill University.

Only a few months before his death Dr. Barton was pressed by his son-in-law, Mr. Frank Dossert, to "confess" about all the instruments that he had invented or perfected. The following list was compiled:—

1. An ether dropper. For many years ether was administered by the open-drop method which was both wasteful and inaccurate. The salient feature of the dropper Dr. Barton devised was the use of a needle valve by which the drop rate could be regulated to obtain the desired air-ether rate for any depth of anæsthesia. When the closed method of administering anæsthetics came into use, the open-drop method practically went into disuse.
2. An all-metal portable table with tilting top to obtain the Trendelenberg position for abdominal operations.
3. A folding all-metal Balkan frame made of gas pipe by the hospital mechanics in the hospital shop to replace the old wood frame. Folds into small space for storage.
4. The Barton obstetric forceps.
5. A modified Kirschner clamp for use with Kirschner wire in the treatment of fractures of the long bones.
6. A hand-operated drill with telescoping attachment for placing the Kirschner wire.
7. A rongeur bone forceps with multiple lever construction increasing the cutting power seven times.
8. A Liston bone forceps with multiple lever construction.
9. A rib shear with multiple lever construction for single rib resection for empyema.
10. A rib shear with multiple lever construction for resecting all ribs including the first for thoracoscopy.
11. A self-retaining vaginal retractor.
12. A uterine dilator.
13. A fracture frame for the reduction and immobilization of bevelled, spiral and comminuted fractures of both bones of the leg.

INSTRUMENTS DESIGNED FOR THE MONTREAL NEUROLOGICAL INSTITUTE

14. A drill guide for drilling an osteoplastic skull bone flap at 45° for suturing with rustless steel alloy wire.
15. A forceps for twisting the wire at a desired tension.
16. A skull tong for the treatment of fracture dislocations of the cervical spine by traction suspension.

Association Notes

THE SEVENTY-SIXTH ANNUAL MEETING OF THE

Canadian Medical Association

TO BE HELD IN MONTREAL, JUNE 11–15, 1945

CONVENTION HEADQUARTERS — MOUNT ROYAL HOTEL

President - - - - DR. HARRIS MCPHEDRAN, Toronto

President-Elect - - - DR. L. GÉRIN-LAJOIE, Montreal

General Secretary - - DR. T. C. ROUTLEY, Toronto

COMMITTEE ON ARRANGEMENTS

Chairman

The President-Elect, Dr. L. Gérin-Lajoie

General Secretary

Dr. T. C. Routley, Toronto

Local Secretaries

Dr. Georges Hébert,
1538, Sherbrooke Ouest, Montreal

Dr. E. S. Mills,
1487 Mackay Street, Montreal

CHAIRMEN AND SECRETARIES OF SECTIONS

Anæsthesia

Dr. Digby Leigh, *Chairman.*
Dr. G. Cousineau, *Secretary.*

Dermatology

Dr. Albéric Marin, *Chairman.*
Dr. L. Ereaux, *Secretary.*

Historical Medicine

Drs. Philippe Panneton and W. W. Francis, *Chairmen.*
Dr. H. E. MacDermot, *Secretary.*

Industrial Medicine

Drs. Aimé Chartier and Vance Ward, *Chairmen.*
Drs. L. Bergeron and H. G. Ross, *Secretaries.*

Medicine

Drs. J. R. Pepin and W. Scriver, *Chairmen.*
Drs. Yves Chaput and Neil Feeney, *Secretaries*

Obstetrics and Gynæcology

Drs. Hector Sanche and A. D. Campbell, *Chairmen.*
Drs. R. Simard and N. Philpott, *Secretaries.*

Ophthalmology

Drs. L. G. Joubert and J. A. MacMillan, *Chairmen.*
Drs. Jean Lapointe and G. S. Ramsey, *Secretaries.*

Otolaryngology

Drs. J. Brahy and G. Hodge, *Chairmen.*
Drs. R. Cloutier and Wm. McNally, *Secretaries.*

Pædiatrics

Drs. G. Lapierre and S. G. Ross, *Chairmen.*
Drs. A. Guilbeault and Lionel Lindsay, *Secretaries.*

Radiology

Drs. O. Dufresne and W. L. Ritchie, *Chairmen.*
Drs. A. Jutras and A. E. Childe, *Secretaries.*

Surgery

Drs. J. U. Gariépy and F. B. Gurd, *Chairmen.*
Drs. Louis Bernard and Gavin Miller, *Secretaries.*

Urology

Drs. O. Mercier and Emerson Smith, *Chairmen.*
Drs. Paul Bourgeois and R. E. Powell, *Secretaries.*

LOCAL PROGRAM COMMITTEE

Chairmen

Le doyen Edmond Dubé, Hôpital Ste. Justine.
Dean Jonathan C. Meakins, McGill University.

Secretaries

Dr. Georges Hébert, 1538, Sherbrooke Ouest, Montreal.
Dr. E. S. Mills, 1487 Mackay Street, Montreal.

SECRETARIES OF LOCAL COMMITTEES

Publicity

Drs. Jean Saucier and H. E. MacDermot.

Golf

Drs. Chas. Hebert and Keith Hutchison.

Dinner to Council

Drs. L. H. Gariépy, Gurth Pretty and W. de M. Scriver.

Arrangements for the meeting are now nearly complete. The Program Committee, both local and central, have been at work for many weeks, and a most attractive program is in preparation.

Divisions of the Association

Alberta

The Board of Directors of the Provincial Association will meet later on and will consider the question of the annual meeting of the Canadian Medical Association, Alberta Division. Whether Canada will discourage provincial conventions as well as national ones, we cannot tell at this time. But that viewpoint will have to be considered.

Medical Societies

District Number Four

The annual meeting of District No. 4 Medical Association was held in Kelowna on Thursday, Thursday, October 26, at the Royal Anne Hotel. Dr. L. A. C. Panton, President, presided over the sessions.

Dr. Gordon O. Matthews and Dr. D. Murray Meekison, both of Vancouver, gave scientific papers, the former dealing with pædiatrics and the latter orthopædic surgery.

The election placed the following in office: *President*—Dr. R. W. Irving, Kamloops; *Vice-President*—Dr. J. R. Parmley, Penticton; *Secretary-Treasurer*—Dr. C. J. M. Willoughby, Kamloops. It was decided that the next annual meeting would be held in Kamloops.

East Kootenay Medical Society

On October 29, a meeting of the East Kootenay Medical Society was held in Cranbrook, where Dr. G. O. Matthews gave a talk on "Some pædiatric conditions and their treatment", and Dr. Murray Meekison spoke on "Common problems met with in dealing with fractures". Other speakers were Dr. M. W. Thomas, Executive Secretary of the College of Physicians and Surgeons, Dr. F. M. Auld of Nelson, member of the Council of the College for the Kootenays, Dr. H. H. Milburn, President of the College of Physicians and Surgeons, Dr. F. W. Green and Dr. W. O. Green.

The officers for the coming year were chosen: *President*—Dr. J. Vernon Murray, of Creston; *Vice-President*—Dr. T. J. Sullivan of Cranbrook; *Secretary*—Dr. W. O. Green of Cranbrook.

West Kootenay Medical Association

The West Kootenay Medical Association held its annual meeting in Rossland on Saturday, October 28, at the Rossland Hospital. The meeting was under the able chairmanship of Dr. E. E. Topliff, President.

The team from Vancouver included Dr. Gordon O. Matthews, Pædiatrician, and President of the British Columbia Medical Associ-

ation; Dr. D. Murray Meekison, Orthopædist; Dr. H. H. Milburn, President of the College of Physicians and Surgeons, and Dr. M. W. Thomas, Executive Secretary of the College. Dr. Matthews and Dr. Meekison contributed papers of a scientific nature to the meeting, while Dr. Milburn and Dr. Thomas addressed the gathering at the banquet which followed.

The following were elected to office: *Honorary President*—Dr. G. M. Kingston, Grand Forks; *President*—Dr. G. R. Barrett, Nelson; *Vice-President*—Dr. Arnold Francis, New Denver; *Secretary-Treasurer*—Dr. Wilfrid Laishley, Nelson.

North East Saskatchewan District Medical Society

The North East Saskatchewan District Medical Society was invited to hold a meeting on September 13 at No. 11 S.F.T.S., R.C.A.F. Station Hospital at Yorkton. A film on the "Modern treatment of burns" was shown and later the Sigerist Health Survey Commission and the Dependents' Board schedule of fees were discussed. Dr. F. W. Rosher was to have been the guest speaker at their meeting on October 11, but due to delayed railway transportation the train did not leave Saskatoon until the Melville meeting was over.

Regina District Medical Society

Regina District Medical Society has been holding meetings regularly in the form of dinners at the Assiniboia Club. The new President is Dr. H. M. Graham and the Secretary is Dr. J. D. Anderson. At their meeting on November 23, Dr. F. G. Buchan, of London, England, was the guest speaker. Dr. Buchan has been Medical Health Officer of Willesden, London, since 1912, and is now lecturer in Public Health Administration and Practice at London School of Hygiene and Tropical Medicine and in Public Health at Guy's Hospital.

Saskatoon District Medical Society

Dr. Buchan addressed a meeting of the Saskatoon District Medical Society on November 24, at a dinner held at the Bessborough Hotel.

La société de chirurgie de Montréal

Séance de la société de chirurgie de Montréal, sous la présidence du docteur Antonio Bellerose, le mercredi 29 novembre, 1944.

ENDOMÉTRIOSE.—Dr. Léon Gérin-Lajoie.

Après avoir rappelé très brièvement ce que comportait la première partie de sa communication, faite en avril dernier, le docteur Gérin-Lajoie aborde la question de l'endométriose extra-utérine ou ectopique. Il signale les localisations de cette variété d'endométriose, localisations variées et nombreuses mais toutes sises dans le petit bassin. La majorité de ces localisations se font par la chute à travers la trompe de cellules endométriotiques, et l'ensemencement alors ne connaît plus de bornes. Il cherche à en expliquer la pathogénie et rappelle les théories émises par Goodall sur ce sujet. La symptomatologie est aussi variée que les localisations, mais l'auteur signale toutefois certains signes qui relèvent de toutes les affections endométriales ectopiques, en particulier pour ce qui a trait aux adhérences qui sont extrêmement intimes avec les organes avoisinants et qui rappellent celles du cancer et de la tuberculose. Le traitement est enfin abordé et s'inspirant de Goodall il parle d'abord du traitement préventif et ensuite du traitement curatif qui doit viser plus à redonner aux organes leurs fonctions que de produire des mutilations.

En terminant, le docteur Gérin-Lajoie présente trois cas qu'il a pris dans sa collection de l'Hôpital Notre-Dame pour illustrer ses deux causeries. Il rapporte l'histoire clinique, le diagnostic posé, les surprises opératoires et les rapports histo-pathologiques qui ont finalement étiqueté les affections comme étant des endométrioses.

TRAITEMENT DES FRACTURES DES OS LONGS PAR FIXATION METALLIQUE INTRA-MEDULLAIRE.—Dr. Antonio Samson.

L'auteur a employé la méthode de Murray pour la fixation des fractures de clavicule par broche de Kirschner dans douze cas. Dans onze cas, il a fait une réduction ouverte, ce qui facilite énormément l'opération.

Présentation de deux cas de fractures de l'humérus au ⅓ supérieur et au ⅓ moyen réduites et maintenues par un clou de Steinman.

Quatre cas de fractures des deux os de l'avant-bras ont été fixés par une broche de Kirschner intra-médullaire avec un excellent résultat.

Deux fractures du calcanéum ont été réduites et maintenues à l'aide de deux clous de Steinman passés à travers la peau.

Cette méthode de traitement est facile et sans aucun danger si toutes les conditions d'asepsie sont observées.

Réunion de la société de chirurgie de Montréal, sous la présidence du docteur Antonio Bellerose, le jeudi 14 décembre, 1944.

Avant la réunion, le docteur A. Bellerose recevait à dîner au Cercle Universitaire de Montréal, en l'honneur du docteur Frank H. Lahey de Boston, le conférencier invité.

Le docteur Lahey a parlé sur "Le traitement des lésions de l'estomac et du duodénum." Il a donné les indications opératoires de ces lésions, a montré une série de transparents, faisant voir les différentes techniques opératoires de gastrectomie sub-totale et totale, de même que des tableaux comparatifs pour illustrer ses résultats.

N.B.—A cette même réunion, élection du nouveau comité exécutif pour 1945:—*Président:* Dr. Pierre Smith; *Vice-Président:* Dr. J.-H. Rivard; *Secrétaire général:* Dr. Paul Bourgeois; *Secrétaire annuel:* Dr. Antonio Samson; *Trésorier:* Dr. J.-E. Cabana; *Bibliothécaire:* Dr. G. d'Argencourt; *Conseiller:* Dr. A. Bellerose.

La société médicale des hôpitaux universitaires de Québec

Séance tenue à l'École de Médecine, Québec, le 6 décembre, 1944.

L'ASPECT BACTÉRIOLOGIQUE DES SALMONELLOSES.—J. E. Morin, Université Laval, Québec.

L'auteur expose dans ce mémoire, l'état actuel de nos connaissances sur les Salmonelle. Après avoir expliqué l'origine animale de ces infections chez l'homme, l'auteur

fait un résumé bactériologique des différentes Salmonelloses rencontrées chez l'homme. Il rappelle ensuite, les nombreux travaux qui ont été faits depuis ces dernières années, sur la constitution antigénique de ces bactéries.

Ceci permet d'établir d'après les données de White-Kauffmann, la classification sérologique de ces types microbiens.

Cette revue générale sur la question, précise l'étiologie d'un grand nombre de maladies infectieuses graves de l'homme, à évolution septicémique ou gastro-intestinale (Food Poisoning). Les Salmonella étant des infections qui proviennent de microbes contenus dans l'organisme des animaux normaux.

L'infection humaine relève de ces microbes qui ont été ingérés avec des aliments de toutes sortes, aliments infectés et préparés de différentes façons.

MALADIES ENTERIQUES.—A.-R. Foley.

La Province de Québec a une mortalité et une morbidité très élevées par ces infections. On peut cependant dire qu'elles sont en régression. Mortalité: 2.2 et morbidité 22.9 par 100,000 âmes.

Chaque cas de typhoïde ou de para-typhoïde est l'objet d'une enquête détaillée en vue d'en établir l'origine et d'instituer les mesures de prophylaxie.

La fièvre typhoïde et les autres maladies entériques sont causées par l'ingestion d'un microbe pathogène spécifique dont le réservoir est l'homme. Ces agents proviennent de l'intestin et des voies urinaires des malades, des convalescents et des porteurs de germes. La transmission peut en être directe ou se faire par l'intermédiaire d'un véhicule alimentaire.

La prophylaxie de la maladie est assez bien connue pour qu'un peuple qui veut se débarrasser de ce fléau puisse le faire assez rapidement en prenant les mesures et en faisant les dépenses qui s'imposent.

LES EMPOISONNEMENTS ALIMENTAIRES PAR SALMONELLA.— J.-P. Dugal.

Les empoisonnements alimentaires relèvent très souvent d'infections causées par des bactéries du groupe des Salmonella.

Le tableau clinique de ces affections est assez caractéristique; la période d'incubation est courte et, pendant la période d'état, le malade présente les quatre symptômes suivants: douleurs abdominales, fièvre, vomissements et diarrhée.

Il existe différentes formes cliniques qui rendent parfois le diagnostic plus difficile; celui-ci est établi surtout par la notion de collectivité des accidents et par la bactériologie.

Le traitement de ces états est uniquement symptomatique; il n'y a pas de traitement spécifique.

Correspondence

Poliomyelitis in the Far North

To the Editor:

During last September and October this isolated community has suffered from a poliomyelitis epidemic, the reporting of which may interest those concerned in the epidemiology of this disease.

There are about one thousand people living in this sub-arctic area quite remote from the outside. Six cases of polio occurred during September and October, 1944, the latter month being classed as winter in this country. Most of these cases were in children; typically starting with headache, stiff neck, slight fever and a flaccid paralysis of one or more groups of muscles in the lower limbs. One child had severe pharyngeal paralysis with inability to swallow. All recovered, but two will have considerable residual paresis. Lumbar puncture showed cell counts averaging 300, mostly lymphocytes.

A thirty-five year old Indian was stricken with the disease in a severe form while cutting wood many miles up the Klondyke river. It is hard to understand how this man acquired the infection while working so far away.

In addition to the epidemic at Dawson, I have received a report that five Indian children died this summer in the Arctic settlement of Old Crow with symptoms highly suggestive of poliomyelitis. Two children in this area have been left paralyzed. No medical attention was given to these Old Crow cases, so the diagnosis could not be confirmed. Old Crow is well beyond the Arctic circle in northern Yukon. The appearance of poliomyelitis so far north must be unique.

A. C. DUNCAN.

Dawson, Yukon Territory,
December 16, 1944.

Pernicious Anæmia

To the Editor:

I would like to present the following concept of pernicious anæmia and related macrocytic anæmias for the consideration of your readers: Just as pellagra is no longer considered a "disease" of the skin, gastro-intestinal tract, or nervous system, but is classified rather as a vitamin deficiency disorder, manifested by a disturbance in the metabolism of probably every tissue cell, so, too, the known facts relating to pernicious anæmia may be construed to define not a "blood disorder" but one which affects the metabolism of diverse systems of the organism.

Thus, the "intrinsic factor", possibly an enzyme secreted into the stomach, (Lasch 1937, Taylor 1938, Gessler 1940) acts upon the "extrinsic factor", possibly some portion of the vitamin B complex, (Goodall 1932, Strauss 1932, Ungley 1933 and 1934, Wintrobe 1939) with the resultant formation of a thermolabile substance which is conveyed to the liver by way of the blood stream. The liver then transforms this *thermolabile* substance into a *thermostable* compound, namely, "liver extract principle". Thus the liver acts not merely in a *storage* capacity, but is *actively* concerned with the *elaboration* of "liver extract principle".

I am also suggesting that "liver extract principle" is in reality a "vitamin" which is possibly concerned with the proper functioning of some enzyme system, in a manner similar, perhaps, to that of nicotinamide, which is involved in enzyme reactions by way of co-enzymes I and II (di- and tri-phosphopyridine nucleotides).

If such a function be conceded for "liver extract principle", the wide-spread disturbances of "pernicious anæmia"—the gastro-intestinal, the nervous, even the blood picture itself—then become readily explainable upon the basis of a disordered metabolism involving one or more particular enzyme systems with which "liver extract principle" is intimately concerned.

If the "intrinsic factor" is absent or deficient, as occurs in so-called "true Addisonian pernicious anæmia" and in high gastric resection, (Bench 1934, Goodman 1935) no thermolabile factor can be formed and deficiency of "liver extract principle" results.

If the "extrinsic factor" is lacking, as may occur in certain instances of macrocytic anæmia, again, no thermolabile factor is produced, and deficiency of "liver extract principle" results.

If the thermolabile factor is *formed*, by interaction of "intrinsic" and "extrinsic" factors, but is not *absorbed*, due to increased intestinal impermeability, as may occur in sprue, or due to gastro-intestinal short-circuits, the thermostable factor cannot be formed, and again a deficiency of "liver extract principle" results.

If the thermolabile factor is absorbed, and conveyed by the blood stream to the liver, thermostable "liver extract principle" can result only in the presence of a liver which is functionally adequate to elaborate "liver extract principle". It is possible that in those instances in which macrocytic anæmia, associated with other bodily disorders, occurs in the presence of liver damage, as in certain cases of hepatic cirrhosis, this function of the liver is disturbed, and deficiency of the thermostable principle results.

Recent work indicates that the *active principle* of liver will soon be isolated and its structure determined. And with this the syndrome of macrocytic anæmia will be removed from the category of "blood diseases" and added to the list of vitamin deficiency disorders.

Respectfully yours,

MORTON KORENBERG, M.D.
Medical Arts Bldg., Montreal.
December 5, 1944.

Special Correspondence

The London Letter

(From our own correspondent)

BRITISH MEDICAL ASSOCIATION MEETING

The annual representative meeting of the British Medical Association last month—postponed from the summer—took the development of a national health service a stage further. After four days of debate, in which just under three hundred delegates were faced with just under four hundred resolutions on the Government's White Paper, the representatives on the negotiating committee were appointed and this last body should be beginning very shortly its meetings with the Ministry of Health to discuss essential modifications in the original official scheme.

Indeed, the most important resolution before the B.M.A. was one from the Council which made it plain that "administrative structure, central and local" should take precedence over all other subjects for discussion, since it is this aspect of the Government's proposals which has caused most concern. It was apparent at the meeting that there was a certain amount of confusion between the two words "administration" and "control". Those who hopefully suggested that the profession should not submit to any control had to be reminded that some form of administration was essential, although what is termed clinical control, it was made plain, is something which will not be tolerated.

The Chairman of Council, in his summing up, favoured an evolution from the present National Health Insurance with development of the hospital services as first in the list of changes, but to some extent it was obvious that discussion of extension of the existing insurance service was taking place without sufficient realization of the implications of the new social security proposals, which will almost certainly cover every citizen and therefore mere extension of insurance to dependents, for example, will scarcely arise as an issue.

The B.M.A. delegates made it clear that they do not want to be employed by local authorities, nor do they want a whole-time general practitioner service. Essentially they want doctors to have an effective voice at all levels of the new administrative set up. The proposed joint boards of the Government's original plan seem to have been so heartily disliked all round that they are likely to be dropped, which leaves the administration of the new health service with central and existing major local authorities levels together with a new regional body—based on a university area—interpolated for planning and certain executive functions.

It is perhaps fair to sum up by saying that there were more negative than positive proposals. One newspaper said that the main impression of the meeting was that doctors wanted to be left alone and that the doctors had "willed almost all the ends and rejected almost all the means". But the chief point that arises is that negotiations can now proceed and everyone wishes the negotiators well in their difficult task.

PSYCHIATRY

Great changes are obviously impending in the field of mental health and these were admirably surveyed by the Minister of Health recently when he attended the centenary celebrations of the Royal Medico-Psychological Association. It is a long time since lunatics were restrained by chains but the atmosphere

of mental hospitals (no longer called asylums) is still not all it should be and it was made clear that the closer the link between the general hospital and the mental hospital, the better for all concerned. A comprehensive out-patient service for psychiatric patients is an obvious step in the right direction and already many teaching hospitals have begun to develop this line.

Better training of psychiatrists is also wanted and a better scheme for well-planned research. The Royal College of Physicians has a committee dealing with all aspects of this complex subject and has already reported on the training of the undergraduate in the field of mental health. Postgraduate training is also most important and must clearly be on a broad basis. It is said that the psychiatric branch of the profession is too broken up into factions, but since all have the same aim, to apply the principles of preventive and curative medicine to the problems of mental health and disease, it is hoped that sectarian differences may be settled.

PHYSICAL EDUCATION

The term "positive health" has been criticized as being without meaning, but the enthusiasts for physical education believe that they can give a practical concept to it. Last year a research board for the correlation of medical science and physical education was set up and it has just issued an interim report with about 150 recommendations.

Broadly, these cover a group of problems from the nursery school right through to the university with some antenatal exercises to begin right at the beginning! Another group of recommendations covers the subject of physical education and the fighting services, and a section on industry is left over at present for later consideration.

The time has already passed when physical education merely means routine exercises to promote physical development, and the new proposals cover a very much wider field.

ALAN MONCRIEFF.

London, January, 1945.

Miscellany

The Views of Medical Officers

(Extract from a letter to the editor of the "British Medical Journal", by S/L W. H. Gossip, R.A.F.V.R.)

"I have always felt that, just because they are of the generations which will be most profoundly affected by any changes made during their absence from civilian life, it would only be right that very great weight should be given to the expression of opinion of Service medical officers regarding a State medical service. But, on further thought, it becomes obvious that only in some cases can these opinions be based on sufficient experience of medical life and work to entitle them to be considered as legitimate evidence of what their possessors do, or do not want. Too many Service doctors have had absolutely no experience of the practice of medicine outside the Services; know nothing of its good points or of its shortcomings; of its pleasures and privileges or of its trials and burdens; of its successes and of its failures; of contact with people in their houses rather than as cases in hospitals. Their answers, therefore, should not be accepted unreservedly nor should too much be made of the Services's percentage who "voted" in favour of this or that reform without a further analysis and regrouping.

"Three divisions should be made and reanalysis taken of the replies from these groups. The first group: the regular medical officers of the armed forces, who are quite likely to be in favour of State control because it is similar to their own way of life. The second group: those who have had previous experience of civil practice but are now inside a "controlled" service and are entitled to express a comparative and worth-while opinion. The third group: those who, after qualifying, have held one or two resident hospital posts before enlistment but who can have no good grounds for being considered as competent to provide equal judgment with the preceding group on the great issues involved. They may well be attracted by the hope that their present existence of—for the most part, except in hectic periods of activity—regular hours and a fixed salary may be their lot in the future. They know no other. They have no yardstick by which to measure the past against their present or the future."

THE WORK OF THE CANADIAN MEDICAL PROTECTIVE ASSOCIATION

(The following extract from the 43rd Annual Report of the Canadian Medical Protective Association contains material of great interest to all members of the profession.— EDITOR.)

The work of the Association this year has seemed heavier than in some previous years. Doctors in the Armed Forces have presented many problems. Many of them are graduates of recent years who took their licensing examination but, knowing they were going into the Armed Forces and not into practice and having no clear idea where they would be practising, did not take out a Provincial Licence. Realizing their liability to suit many of these doctors applied for membership in the Association. Because the defence of an unlicensed doctor, whether doing military or civilian practice, is extremely difficult, if not impossible, the Association is unable to accept for membership doctors who have not obtained a licence in some Province. Prior to the war the Association By-laws demanded that doctors be "duly licensed" which term was taken to mean that

they must be licensed in the Province in which they were practising. After considerable discussion with members and with the Army Medical Corps it was decided that for doctors in the Armed Forces the phrase "duly licensed" would mean having a license in some one Province in the Dominion of Canada.

Doctors need to keep in mind the fact that they are liable to malpractice action in military as well as civilian practice and that therefore the need for some assistance under these circumstances remains. Doctors in the Armed Forces who are members of this Association need to remember that the assistance we can offer is confined to the Dominion of Canada. Therefore when they are posted elsewhere they should obtain membership with one of the two British Defence Unions, both of which provide assistance wherever the doctor may be.

During the year one of the members of the Association was Court-martialled under circumstances which made it seem necessary to him and to his advisers to obtain Civilian Counsel. This our member did. Civilian Counsel contributed valuably to our member's defence and he was exonerated.

After the Court-martial our member realized that he had membership in the Association and applied for reimbursement of his expenses. Our General Counsel considered the circumstances and the Association decided that his expenses properly were a responsibility of the Association and they were paid.

It is obvious that under ordinary circumstances the Association cannot hold itself responsible for the payment of expenses for cases the nature of which the Association does not know and in the defence of which the Association has played no part. This is as true for cases involving members who are doctors in the Armed Forces as for members in civilian practice. In this case it did seem that the Association had a duty to its member, but it is perfectly possible that cases may arise where, if the Association has not been notified previously, it will not be possible to pay the expenses incurred by the member. Members, to ensure assistance, must notify the Association when trouble arises—not after they are committed to a course of action, or after the case has been decided.

One case that was defended by the Association during this year in which judgment was rendered against our member is worthy of comment. Several points arise all of which are pertinent to ordinary everyday surgical practice.

Our member was removing an urethral caruncle. His patient was placed in the usual position, the perineum prepared with alcohol on a swab held in a long forcep. She was draped and the little tumour grasped and removed by a diathermy cutting current. Just as the tumour was coming away the surgeon noticed a heat wave coming up under the drapes and on pulling off the drapes as quickly as possible found that a little alcohol from the preparation had run into the towel under the patient and had ignited. The patient received third degree burns of moderate size on her buttocks. These required treatment for some weeks, eventually healing without any scars which were disabling.

The judgment against our member stressed several points which have wide application. Our member admitted his awareness of the possibility of a spark igniting alcohol. He admitted also that while such an accident had never occurred in his own personal experience, he was aware that it had occurred with other surgeons. He stated further that in spite of his knowledge of the possibility and the fact that the accident had occurred to other surgeons he took no steps to guard against such an accident in this particular case. On the basis of these admissions, together with evidence of different and better techniques were used by other surgeons who gave testimony at the trial, the Judge found our member had failed to use the proper and reasonable precautions which a surgeon of ordinary skill and prudence would have taken. He therefore found that he was unskilful and negligent.

The question of a surgeon's responsibility for the surgical techniques used in his hospital arises as an indirect result of this case and this judgment.

In most hospitals, partly as the result of the wishes of the attending surgeon and conditioned by the facilities available in the hospitals, certain techniques of preparation and so forth are arrived at in operating-rooms. In this case an accident occurred. The method of preparation used was the one that had been used in that hospital for years. The precautions taken were those usually taken during that preparation. In spite of this the accident occurred and in Court the surgeon, not the hospital, was found guilty of negligence and unskilful attention to his patient. After the case had been concluded, discussion with the surgeon about the possibility of the hospital changing the preoperative preparation in subsequent operations of this kind brought out the fact that this was a hospital method of preparation and there was some doubt as to whether it would or could be changed by the surgeon. Surgeons need to remember that when trouble arises as a result of such technique not the hospital but the surgeon who allowed and employed the technique is held solely responsible. Surgeons must realize that they not only have the responsibility but also the power to state that such and such a technique must be changed if the need for such change arises.

The Judge drew attention to another point that is worth remembering. From a legal point of view doctors still are held responsible for the work they themselves state they can do. This remains true although certification of specialists

is becoming more common and with the passage of time will be still more common in Canada. A doctor who claims he is doing only general practice will be held responsible by the Court for work of the quality usually done by general practitioners in his own district. Doctors who claim they are specialists likewise will be held responsible in Court for work of the quality done by other men practising the same specialty in the same district. In this case the Judge drew attention to the fact that the doctor claimed he was a specialist, that he was head of his own department in his own hospital and that therefore the patient had the right to expect of him better service, better care, and a greater degree of skill than the patient might have found elsewhere. In the Judge's opinion our member was guilty also in that he had failed to provide not only the usual but this extra degree of care and skill.

This year for the second time in its history, the Association was called upon to defend a member who, in this case against advice, had already paid to the patient some money after threats began. Our member had the misfortune to open into the bladder during a pelvic operation. Repair was unsuccessful and another attempt at repair was unsuccessful. Our member wrote asking if he might supply the patient with enough money to go to another city for another attempt at repair. He was advised that any payment to the patient would be unwise in the extreme and that he should not do it. However, at various times over a few months he paid the patient a total of $1,500.00. Trouble did not arise until the doctor refused the patient's demands for a much larger sum of money. Then suit was brought. Members need to know that it is the height of folly to accede to a patient's demand for money in recompense for alleged poor work. If after the payment of money by the doctor to the patient such a case reaches Court it is only reasonable to expect that the Court will look on such payment as an admission of responsibility. Defence of such members, therefore, is almost an impossibility and prudence forces the Association to refrain from assisting a doctor who has thus committed himself. Under such circumstances, therefore, doctors should refuse even to discuss the question of financial recompense.

J. FENTON ARGUE, M.D.,
President.

The American College of Surgeons will hold a meeting at the Royal York Hotel, Toronto, on March 5, 1945. All doctors are cordially invited.

Abstracts from Current Literature

Medicine

Vitamin B Deficiency in Private Practice. Merrill, D.: *New England J. Med.*, **231:** 174, 1944.

Disease caused solely by vitamin B deficiency (pellagra, beriberi, ariboflavinosis, polyneuritis and the Wernicke syndrome) is rare as dietary habits must be grossly inadequate to bring it about. As a complication of other diseases it is not infrequent. It must be looked for whenever the metabolism of the body is increased, such as with increased muscular activity, increased caloric intake, fever, hyperthyroidism, long continued vomiting or diarrhœa or dietary restrictions.

It is very important to recognize the earliest manifestations of vitamin B deficiency since they are then easily reversible with proper therapy. If the deficiency continues it will reach a stage of nonreversibility.

Eight case reports are presented in detail. The precipitating or contributory factors were usually multiple and consisted of fever, a bizarre diet, chronic diarrhœa, poor teeth or badly fitting dentures, preoperative apprehension, infusions of glucose solutions, hard manual labour, obesity, drug addiction, diets rich in starch and sore throat or sore mouth. NORMAN S. SKINNER

Cardiospasm as a Cause of Pneumonitis. Gray, W. and Jankelson, I. R.: *New England J. Med.*, **231:** 522, 1944.

Patients with cardiospasm are liable to retain food in the œsophagus which may be regurgitated, enter the trachea and lead to bronchial irritation and pulmonary infection. Such regurgitation is particularly prone to occur during sleep, when the normal protective reflexes are less sensitive, but it has also been shown to occur in certain patients with œsophageal obstruction after the swallowing of barium. Sudden awakening from sleep with coughing, strangling and choking is not infrequent in cases of œsophageal food retention.

Various types of lung infection may result from such inhalation of regurgitated œsophageal contents. Two cases are reported in detail, the first a case of chronic pneumonitis with repeated exacerbations, the second a patient with repeated acute pneumonical episodes. Excellent results followed dilatation of the cardia with bougies.

The authors recommend that routine investigation of the œsophagus be carried out in all cases of etiologically obscure chronic pneumonitis or recurrent acute pneumonia. NORMAN S. SKINNER

The Prevention of Respiratory Tract Bacterial Infections by Sulfadiazine Prophylaxis in the United States Navy. Coburn, A. F.: *J. Am. M. Ass.*, **126:** 88, 1944.

This article describes the experience in some of the units of the U.S. Navy in the control of respiratory infections by small daily doses of sulfadiazine. The author states: "In the first year of World War II a significant development in the armed forces was the increasing morbidity rate from respiratory infections, and in the U.S. Navy the majority of the important respiratory diseases were caused by the hæmolytic streptococcus". The experience in prophylaxis at three naval training centres is given in the present paper.

Naval Activity A, in Chicago, experienced a high incidence of respiratory disease during the early part of the winter of 1943-44. About 10% of the available man power was lost from this cause. In February all personnel was placed on a regimen of 1 gm. of sulfadiazine per day. A rapid decline in respiratory disease, scarlet fever and rheumatic fever occurred. No control groups were used in this case, but the decline was quite contrary to the seasonal experience in the previous year and other groups in the same area showed no such decline.

The second centre, designated as Camp 1 showed a moderate incidence of streptococcus infection during December and January. In February the scarlet fever incidence began to rise rapidly, accompanied by other streptococcus respiratory diseases. Half of the men were placed on a daily dose of 1 gm. of sulfadiazine, the other half remained untreated. The incidence of scarlet fever in the treated group promptly dropped to very low levels while the incidence in the untreated group actually increased: 5,000 men were involved in this observation.

Activity 3 is designated as Camp 2. In November, 1943, all even numbered companies were placed in group A and given no prophylaxis. Odd numbered companies were placed in group B and given 0.5 gm. of sulfadiazine daily. On March 1 both groups were placed on a daily dose of 1 gm. of sulfadiazine. The results are similar to those of the first 2 groups. Group A (untreated) during January and February had a high incidence of respiratory diseases; group B during January and February had an incidence less than half that of group A. In March both groups had exactly the same incidence.

Mild symptoms, chiefly dermatitis, occurred in 0.2 to 0.7% of soldiers receiving the drug. Dangerous reactions occurred in 0.01%. These reactions were either exfoliative dermatitis or granulocytopænia. One man died. At autopsy it was found that he was suffering from leukæmia. FRANK G. PEDLEY

A Summary of Eighty Living Cases of Pernicious Anæmia. Hardgrove, M. *et al.*: *Ann. Int. Med.*, **20:** 806, 1944.

A study has been made of 80 living cases of pernicious anæmia who have been under treatment, 17.5% for more than 10 years. The highest incidence occurred in the seventh decade, although the age varied from 37 to 83 years. A possible family history was obtained in 12.5%. A majority (67.5%) were derived from three national groups: German, Polish, and Irish. One was a negress. Of the 80 patients, 28 were male and 52 were female. In about 14% the hair became grey before 30 years of age. In one case grey hair became dark under treatment. In 67.5% eyes were blue, grey or green, and in the rest brown. A correct diagnosis was made during the first year of illness in only 36.25%. In 53.75% the diagnosis was not made by the first physician consulted, and in 86%, it was not adequately established until hospitalization.

The most common initial symptoms were weakness and fatigue. Sore tongue occurred at onset in 56%; paræsthesias in 71%; disturbances of gait in 41%; bladder disturbances in 32.5%, and gastro-intestinal complaints in 82.5%. Heart disease of a degenerative type occurred in 33.7%.

Treatment was designed to keep the red blood cell count between 4,500,000 and 5,000,000, and the hæmoglobin above 80%. Maintenance of weight also seemed to be an important guide as to efficiency of treatment. This was accomplished satisfactorily in 66% of the cases by one injection of 3 c.c. of crude liver extract (15 units) every four weeks, and in 11.5%, every 3 weeks. In individual cases more frequent injections were required.

Reactions to injections of liver extract, usually allergic in nature, occurred in 27.5% of the cases, and in 5, forced a change to oral therapy.

Nineteen patients discontinued treatment for periods of 3 months to 5 years, but all subsequently resumed it. The time elapsing before severe relapse occurred, varied greatly in different patients. S. R. TOWNSEND

Tuberous Sclerosis Associated with Tumour of the Optic Disk (phacoma). Glicklich, E. A., Schultz, A. and Benjamin, J. E.: *Arch. Ophth.*, **32:** 60, 1944.

The case reported is that of an American soldier discharged from the army with epilepsy. The history was of interest, and made one speculate as to why he had been accepted into the army at all. His father, aged 63, was much below par physically and mentally, and had adenoma sebaceum. There were two girls and five boys in the family. One girl was living and normal, and two brothers had died at the ages of 10 months of colitis and three years of pneumonia, respectively. The other four children in the family were affected. The sister had adenoma sebaceum; one brother aged 39 had adenoma sebaceum, epilepsy from the age of 4 on, and marked mental retardation, never having progressed beyond the third grade in school. Another brother had died at the age of 20 from some unknown cause. He had had epilepsy since he was four and showed mental retardation. The patient, aged 22, had adenoma sebaceum, epilepsy since the age of 7 years, and was mentally retarded. He had not progressed beyond the fourth grade in school at the age of 14, and although having learned to read and write, had never been able to do arithmetic. This family shows the hereditary nature of this disease. MADGE THURLOW MACKLIN

Familial Multiple Periostitis Ossificans. Bernard, L. J.: *Med. Bull. Veterans' Administration*, **21:** 67, 1944.

This man, a veteran of the last war presented a picture of multiple abnormalities. He had unusually large hands and feet; absent thumb nails; thickened, brittle unusually curved nails on the fingers, and patellæ dislocated to the outside of the knees. His father, whose four sibs were normal, had the large hands and feet and absent thumb nails. The patient had 4 sisters and 4 brothers. Three of the sisters and 2 of the brothers had the very large hands and feet, but their thumbs had nails and the patellæ were apparently normal. One affected sister and one affected brother had each one affected child like themselves, with very large hands and feet. The patient had 3 children, two normal, and one daughter with dislocated patellæ and absent thumb nails but normal hands and feet as far as size was concerned. Note: It would seem that more than one hereditary defect was present in this family, or that there was but one defect capable of being modified in its expression in different members. MADGE THURLOW MACKLIN

Surgery

Penicillin in the Treatment of Chronic Osteomyelitis. Anderson, D. G. *et al.*: *Arch. Surg.*, **49:** 245, 1944.

Penicillin is the most effective chemotherapeutic agent yet discovered for the treatment of staphylococcic infections, as in chronic osteomyelitis. The authors have made a critical study of this disease in 40 patients. As they state, "such a study should have two aims; one to evaluate the effectiveness of penicillin for this disease and the other to determine, if possible, the most satisfactory method of employing this new therapeutic agent. Prolonged observation of patients after the completion of treatment is necessary before final conclusions can be established." In 25 of the cases follow-up observations were conducted for a year or longer after completion of the first course of treatment. One of the most remarkable properties of penicillin, is its lack of significant toxicity. The authors comment that penicillin by inhibiting the growth and multiplication of bacteria will arrest the infection in a high percentage of cases of chronic osteomyelitis and thus allow healing of both bone and soft tissue to take place.

Of the 40 cases which they report, operative procedures were continued with the use of penicillin in 14.

In 28 patients, or 70% (at the time of writing) there are no draining sinuses or other symptoms or signs of infection. Primary closure following sequestrectomy or evacuation of an abscess of a bone is a safe and satisfactory procedure for patients who are receiving penicillin. G. E. LEARMONTH

Obstetrics and Gynæcology

A Case of Complete Placenta Prævia Accreta Occurring in a Primigravida. Shotton, D. M. and Taylor, C. W.: *J. Obst. & Gyn. Brit. Emp.*, **51:** 340, 1944.

Hysterectomy is the only safe treatment for complete placenta accreta. Cunningham states that the mortality in patients treated by manual removal is 70%, whereas after abdominal hysterectomy it is less than 6%. Attempts at manual removal lead to such severe complications as inversion or rupture of the uterus and profuse hæmorrhage, and only increase the risk when hysterectomy has to be performed subsequently. In the present case immediate blood transfusion undoubtedly saved the patient's life.

A case of complete placenta prævia accreta in a primigravida is reported and the pathology described. The etiological factor appears to have been curettage for sterility. Treatment by hysterectomy and the value of blood transfusion are stressed. P. J. KEARNS

A Case of Primary Ovarian Pregnancy. Chisholm, A. E.: *J. Obst. & Gyn. Brit. Emp.*, **51:** 321, 1944.

This case of primary ovarian pregnancy occurred during the 2 weeks following the first missed period and thus conformed with what is usual in the cases recorded by others, *i.e.*, the total absence of any vaginal bleeding and other signs of abnormality other than pyrexia, lower abdominal tenderness and collapse are atypical, since shock, vaginal bleeding, and the other well-known phenomena of ruptured tubal pregnancy are recorded in similar cases by other observers. The exact mechanism whereby endometrial tissue develops in the ovary in such cases is obscure, but in all probability this is best understood if Meyer's theory is accepted, *i.e.*, the differentiating potency of the germinal epithelium. P. J. KEARNS

Psychodynamic and Therapeutic Aspects of Functional Dysmenorrhœa. Wengraf, F.: *Am. J. Obst. & Gyn.*, **48:** 475, 1944.

As a psychosomatic entity, dysmenorrhœa is understandable, if the psychic mechanism can be explained by carefully elucidating the history. The psychogenesis is co-ordinated to the neurosis and all its symptoms. A definition of this symptom is given in an effort to comprehend all its manifestations, and to relate them to the whole personality.

The persistence and manifestations of the underlying psychic energy are shown in two case reports; in another, the dysmenorrhœa was replaced by other neurotic symptoms. Psychotherapy in secondary dysmenorrhœa seems promising, as demonstrated in one case report.

Another feature of this symptom is, in the author's opinion, the fact that its investigation provides an approach to the unconscious of neurotics in any psychotherapeutic procedure. ROSS MITCHELL

Gastro-intestinal Bleeding Due to Vitamin K Deficiency Complicating Labour. Malone, E.: *Brit. M. J.*, **2:** 559, 1944.

The case history of a patient developing gastro-intestinal bleeding during the last stage of labour and early puerperium is recorded, with evidence supporting the view that the hæmorrhagic tendency resulted from lowered blood prothrombin level; clinical recovery followed the administration of vitamin K.

Pregnant women who have suffered from an obstructive jaundice and consequent dietary deficiency in fats would benefit by having a prothrombin index taken before the onset of labour, so that vitamin K administration may be instituted, if necessary, to prevent a hæmorrhagic tendency from developing as a result of hypothrombinæmia. ROSS MITCHELL

Episiotomy. Flew, J. D. S.: *Brit. M. J.*, **2:** 620, 1944.

The disadvantages of a torn perineum are discussed and compared with the disadvantages of unseen damage that may occur as a result of keeping the perineum intact. In order to minimize all these disadvantages early episiotomy is advocated, and the cases in which episiotomy should be performed are stated. The relation of injury sustained during labour to prolapse of the uterus and vaginal hernia is discussed. Certain perineal anatomical points of practical methods in performing episiotomy are mentioned. The methods of performing the operation are described. Figures are given which indicate that patients on whom early episiotomy is carried out are less prone to pelvic damage than those in whom the perineum remains intact. ROSS MITCHELL

Otolaryngology

Extranasal Block Anæsthesia for Submucous Resection of the Nasal Septum. Fred, G. B.: *Ann. Otol. & Laryngol.*, **53:** 127, 1944.

There are some noses in which a complete block by an anterior deviation of the septum prevents the introduction of any cotton pledgets. Therefore, the author proposes a method of securing local anæsthesia by means of an extranasal injection of the nerves supplying the septal mucous membrane before they enter the nasal cavity.

The novocaine injections are made into both anterior ethmoidal nerves at the inner angle of each orbit, and both spheno-palatine ganglia through the mouth by way of the great palatine foramen situated just medial to the upper third molar tooth.

The anterior ethmoid nerve can be blocked at the upper inner aspect of the orbit. A one inch long needle introduced one cm. above the inner canthus of the eye, follows the upper edge of the lamina papyracea, and at a depth of 1 inch, 1 c.c. of novocaine 2% is injected between the bone and the periosteum.

The sphenopalatine nerve can be blocked by injecting novocaine 2% through the greater palatine foramen; a 45 degree angle adapter with its needle is used. The foramen can be palpated with the forefinger just medially to the upper third molar tooth and about ¼ inch anterior to the posterior edge of the hard palate. The needle passes up the great palatine canal 1½ inches and 2 c.c. of 2% novocaine is injected. One should draw back on the syringe to be sure that the anterior ethmoidal artery or the blood vessel in the greater palatine canal have not been entered. In order to secure hæmostasis, the author injects the septal mucous membrane along the line of the proposed incision with 1-20,000 of adrenaline chloride; hæmostasis is not as thorough as when cocaine-adrenalin cotton pledgets are used.

Infection in the great palatine canal or thrombosis of or hæmorrhage from the vessels has not happened in 200 cases of submucous resection of the septum or in numerous local operations on the ethmoid sinus. Infection of the orbital cavity can be prevented by ordinary cleanliness and has not occurred. Proptosis of the eye has been observed in a few cases immediately after the injection; it happened 3 times in 200 cases and disappeared without any sequelæ within a few days.
V. LATRAVERSE

The Eustachian Tube; a Review of its Descriptive, Microscopical, Topographical and Clinical Anatomy. Graves, G. O. and Edwards, L. F.: *Arch. Otolaryn.*, **39:** 359, 1944.

The structure and function of the Eustachian tube of the adult are thoroughly considered and richly illustrated with original and excellent figures. The mechanism is exhaustively analyzed and its mode of operation presented in a clear and practical way. There are sections on roentgen visualization of the tube and its malformations, tumours, and foreign bodies. Special attention is given to the tube in the newborn. The last

quarter of the paper deals with the tube in military and other work, with special emphasis on its involvement in aviation, caisson and submarine activities. Various treatments for inefficiency in operation are discussed. "Shrinking of the Eustachian orifice by application of an aqueous solution of an ephedrine salt or a similar vascular constrictor in addition to the factor of passing time seems to yield the best results". This paper is an exhaustive presentation of the subject and must be read to be appreciated. The work involved in its production was great and was done in the Departments of Anatomy and Medicine of the Ohio State University by aid of a grant from its graduate school.

C. C. MACKLIN

Orthopædics

The Use of Aluminum Acetate in the Treatment of Malacic Disease of Bone. Ghormley, R. K. and Hinchey, J.: *J. Bone & Joint Surg.*, **26:** 751, 1944.

According to presently accepted theory parathormone controls the blood inorganic phosphate level by stimulating the excretion of phosphate by the kidney and by mobilizing calcium from the bones to form calcium phosphate which can be excreted. This parathormone action is stimulated by the presence of phosphate in the blood. In order to reduce the amount of phosphorus absorbed a special solution aluminum acetate was given to patients by mouth. After six months to a year on this solution some improvement was noted in cases of osteoporosis, Paget's disease, osteitis fibrosa, and osteogenesis imperfecta. Owing to the presence of lead in solutions of aluminum acetate care must be taken to see that plumbism does not develop.

GUY H. FISK

Roentgenology

Intra-Ocular Calcium Shadows; Choroid Ossification. Kautz, F. G. and Schwartz, I.: *Radiology*, **43:** 486, 1944.

Calcium shadows in the region of the lens have been repeatedly observed by ophthalmologists. Roentgenological reports are scarce. Twining and Shanks distinguish four groups of intra-ocular calcium shadows: (1) calcification of the lens; (2) ossification of the vitreous; (3) calcified atheroma of the carotid and ophthalmic arteries; and (4) a shrunken calcified globe. Arteriosclerotic shadows are usually extrabulbar within the orbit or within the optic canal posteriorly to the globe.

The authors have observed 7 cases of intra-ocular calcification and report their clinical, anatomical and roentgen findings.

The anatomical lesion is a more or less extensive choroid ossification. The bony character of the lesion can often be disclosed radiographically.

The lesions can readily be seen on conventional roentgenograms of the orbit. The majority of the patients were middle-aged and accidental disturbances of the remaining eye or recurrence of pain in the previously damaged eye brought the lesion to medical attention. In several instances no complaints were recorded and the lesion was an incidental finding on sinus radiography.

R. C. BURR

Therapeutics

The Treatment of Sulfonamide Resistant Gonorrhœa with Penicillin Sodium. Sternberg, T. H. and Turner, T. B.: *J. Am. M. Ass.*, **126:** 156, 1944.

A total of 1,686 patients refractory to at least two courses of a sulfonamide and in some cases to artificially induced fever, were treated with total dosages varying from 40,000 to 160,000 Oxford units per case, the individual dose being 10,000 to 20,000 units intramuscularly every 3 hours.

These studies showed penicillin to be a remarkably effective drug in the treatment of gonorrhœa, usually causing disappearance of symptoms and reversal of bacteriological findings within 48 hours. One course of treatment with a dosage of 160,000 units per case effected cures in 98%; 80,000 to 120,000 units in 96% and 50,000 units in 86%. Factors such as duration of infection, previous fever therapy, and race appeared to have no effect on the results of therapy. Of the 126 failures to one course of penicillin, 85 were re-treated, using a 100,000 unit dosage. Of these, 78 or 91.8% were cured. Thus by re-treatment of failures with a second course, 99% cures were obtained. No case in the entire series proved to be penicillin resistant.

Complications to gonorrhœa responded well to penicillin, although the more serious forms of complications required prolonged treatment with higher dosage.

S. R. TOWNSEND

Pathology

Pathological Anatomy of "Atypical Pneumonia, Etiology Undetermined" (Acute Interstitial Pneumonitis). Golden, A.: *Arch. Path.*, **38:** 187, 1944.

Autopsy findings on 42 cases of "Atypical pneumonia, etiology undetermined", are reviewed. Twenty-one represented acute interstitial pneumonitis, uncomplicated by secondary broncho- or lobar pneumonia, and it is toward these 21 that chief attention is directed. In these cases, most of which were fatal in the first five days of the disease, the essential and constant lesions were confined chiefly to the smaller branches of the bronchial tree. The bronchioles were dilated; their walls were greatly thickened, and infiltrated with mononuclear cells. Ulceration of the bronchiolar mucosa was marked, and the lumina filled with pus, mucoid fluid, and desquamated epithelium. The tissue surrounding the affected bronchioles was similarly infiltrated with mononuclear cells. These changes were focal in nature, occupying a portion of one lobe up to all of both lungs. Most of the alveoli were air containing and a few were collapsed. Other prominent changes were intense vascular congestion of the alveoli, metaplasia of epithelium, both alveolar and bronchiolar, and the formation of hyaline plugs in the alveoli.

Clinically, the fatal cases exhibited marked dyspnœa, which the author believes was due to massive plugging of the smaller bronchioles, the mononuclear infiltration of the alveolar walls and the marked congestion. Anoxæmic effects were noted in the brain in several of the cases, producing an hæmorrhagic encephalopathy. The leukocyte count of the fatal cases was high, predominantly polymorphonuclear. Sputum was scanty, rarely bloody, and contained a variable bacterial flora. No organism could be isolated constantly, and usually the stained sections revealed no bacteria. A virus was isolated from one case which produced similar pulmonic lesions in cotton rats and hamsters. On a speculative basis the author believes this form of pneumonitis probably is due to a virus, and he points out the similarity of the pulmonary lesions to those previously described in the lungs of many patients dying in the first five days of measles and influenza, and in swine given influenza virus alone.

ELIZABETH CORBETT

Hygiene and Public Health

An Epidemic of 3,000 Cases of Bacillary Dysentery Involving a War Industry and Members of the Armed Forces. Kinnaman, C. H. and Beelman, F. C.: *Am. J. Pub. Health*, **34:** 949, 1944.

An outbreak of 3,000 cases of bacillary dysentery (shigella paradysenteriæ) in a town of 11,048 inhabitants is described. The outbreak was explosive in character and was distributed throughout the entire town. All age groups were affected but the particular group most affected was that of 5 to 14 where the attack rate was 45%.

In spite of the fact that only a small part of the milk supply was pasteurized it was evident that such a massive infection of the population could hardly come from a multiplicity of milk sources or from any other

source than water. The town's water supply was derived from 8 drilled wells of an average depth of 125 feet. Samples of water taken from the wells showed no contamination, but samples from various points in the distribution system showed heavy contamination. Many cross connections between the city supply and private systems and between the city supply and the sewerage system were discovered but it seemed unlikely that these could have accounted for such widespread contamination.

The city officials had stated that no change in the city water system had been made recently but this was found not to be so. Actually changes had been made on the two main supply lines entering the city. It was also discovered that near where the changes had been made a block in the sewer had occurred. A direct connection between the overflowing sewer and the water mains was demonstrated and it seemed obvious that contamination of the water supply had occurred at this point.

The massive morbidity made the epidemic of rather special interest, but two other things were also noteworthy: First, because of the boasted purity of the water (99.9% pure) the A.T. & S.F. Railroad had made it a practise to empty its water tanks and refil at this point. No information could be secured of the number of cases of dysentery among the passengers on the railroad. Second, the ineffectiveness of the local part-time health department was demonstrated and local funds were made available for a health unit as a result of the local interest created by the epidemic.

FRANK G. PEDLEY

Nutritional Iron Deficiency Anæmia in Wartime; Part 3, The Hæmoglobin Levels of School Children and Pregnant Women in 1944 Compared with the Levels in 1942 and 1943. Davidson, L. S. P., Donaldson, G. M. M., Lindsay, S. T. and Roscoe, M. H.: *Brit. M. J.*, **2**: 333, 1944.

This is the third article dealing with observations on the hæmoglobin levels of various population groups in Edinburgh. The first two studies showed a significant amount of anæmia in the school children and pregnant women studied. The present article records an appreciable improvement in the picture both for the children and the women. Some of the children in School 1 were given ferrous sulphate for 3 months and in School 3 ferrous sulphate and ascorbic acid for 6 months. These children showed a rather definite improvement in hæmoglobin levels up to a year following conclusion of medication. They have not been included in the table given below for 1943, but have been included in the 1944 figures since their average did not differ from that of the children who did not receive iron. The following table gives the results, the numbers in parentheses referring to the number of children tested:

	1942	——1943——			1944
School 1	Sept.	Feb.	June	Dec.	June
Mean Hb. %	82.9(347)	83.1(149)	87.1(40)	86.0(110)	87.5(237)
Stand. dev..	7.2	6.8	4.8	8.8	6.1
School 3	July	March	June	Dec.	June
Mean Hb. %	77.5(96)	81.9(42)	87.5(28)	85.6(56)	90.8(64)
Stand. dev. .	4.6	6.7	6.6	8.1	5.4
Preg. women	July				Jan.-July
Mean Hb. %	77.0(64)				86.8(61)
Stand dev. .	7.3				7.2

The reason for the rather consistent increase in hæmoglobin is difficult to give. It is suggested that the replacement of white flour by national wheat meal flour may have been a factor.

FRANK G. PEDLEY

Industrial Medicine

Dermatophytosis and Occupational Dermatitis. Downing, J. G.: *J. Am. M. Ass.*, **125**: 196, 1944.

One hundred years ago the founder of medical mycology met with ridicule. Today the rôle of the fungus diseases affecting man is recognized as important. These infections occur in occupation, particularly among those persons who till the soil or who contact plants, hay, straw, animals or their by-products, feathers, silk, wool and leather.

Fungous diseases of man may be superficial or deep-seated. In this article the author discusses the subject of dermatophytoses (the superficial infections) in relation to occupational dermatitis. Frequently, cases of occupational dermatitis are incorrectly diagnosed as fungous infections. It is very difficult to make a positive diagnosis of the latter without laboratory evidence.

The claim that an industrial dermatitis is persisting because of secondary infection with fungi can rarely be proved by microscopical or cultural methods. The secondary invaders are usually pyogenic bacteria. A person suffering from a contact dermatitis is no more subject to fungous infection than one with normal skin. The organisms may be found in an occupational rash but they are not necessarily the causative factors of the original eruption, as they may be present in any macerated tissue. Several studies have been made in industry where sensitization due to a distant fungous infection such as that on the feet has been considered an important factor in the precipitation of certain types of local reactions. Such relation is important from the standpoint of compensation. In Massachusetts a fungous infection of the skin is not compensable. In a review of 2,000 cases of cutaneous eruption among industrial workers, 179 were deemed dermatophytosis and therefore not compensable. Among 1,433 patients with industrial claims encountered in private practice from 1938 to 1942, about 10% showed clinical evidence of fungous infection.

As an aid to correct diagnosis the author gives a detailed description of various skin affections as they appear on the hands. He also discusses treatment, which is frequently complicated, and gives prescriptions to be used at different stages of the disease. He warns against the use of sulfonamide compounds, as there is no proof of their being of value for fungous disease, and they can themselves cause serious cutaneous reactions.

MARGARET H. WILTON

The Local Use of the Sulfonamides—a Report of 846 Cases. Aldrich, R. H., Savina, A. R. and Walsh, R. A.: *Indust. Med.*, **13**: 693, 1944.

The local use of the sulfonamide drugs is now standard procedure in many industrial clinics for reducing the incidence and severity of infection following injury. The authors base their opinions on findings in 846 cases. These included lacerations, abrasions, avulsed wounds, minor burns, infections of the vagina and cervix, furuncles and carbuncles, impetigo, infected leg ulcers, epidermophytosis with secondary infection, infected eczemas and pilonidal sinus (postoperative).

Experimental and clinical evidence has demonstrated the increased effectiveness of the sulfonamides when applied directly to the wound or skin lesion. In powdered form they present difficulty in that there is a tendency towards "caking", causing them to act sometimes as a foreign body in the wound. For this reason an oil-in-water emulsion has been found to be an appropriate vehicle for their external application.

The need is stressed for caution when applying these chemotherapeutic agents. For best results, careful débridement and gentle cleansing must be done, as the sulfonamides cannot function effectively in the presence of para-aminobenzoic acid or breakdown products of pus, exudate and bacteria. The combination of 3.75% sulfanilamide and 1.25% sulfathiazole suspended in a special oil-in-water emulsion base with a wetting agent, was the most effective sulfonamide product.

The authors advise, in so far as possible, administering the sulfonamides locally for only 5 to 7 days in order to cut down sensitivity reactions. Should it be necessary to continue treatment longer, signs or symptoms usually associated with such reactions must be watched for. Of the 846 cases, only 4 showed any signs of sensitivity. They advise also extra caution when treating patients with a history of allergic manifestations and of previous sulfonamide therapy.

MARGARET H. WILTON

Obituaries

Dr. Matthew George Archibald's death occurred recently at Kamloops, B.C., where he had practiced since 1905. This will be learned with deep regret by his many old friends in Nova Scotia. He had a great love for the land of his birth and returned as often as possible to revisit the friends of his youth. He was a classmate of Dr. A. MacD. Morton, who died a few weeks ago, and on each visit East they had a private class reunion.

Dr. Archibald was elected to honorary life membership in the Canadian Medical Association a year ago, an honour which he well deserved as he had taken a very active part in medical affairs for many years.

Dr. Robert E. Davis died at his home in Deer Lodge, Manitoba, on December 10. Born at Ottawa in 1869, he graduated in medicine from McGill University in 1894 and after two years' postgraduate work in St. Bartholomew's Hospital, London, he practiced in Minnesota. In 1904 he removed to Winnipeg practicing there until 1927, when he retired on account of ill health. He is survived by his widow, a daughter and three sons.

Dr. John Albert Dobbie, former superintendent of Ottawa Civic Hospital and past Grand Master of the Grand Lodge of the Masonic Order in Ontario, collapsed and died January 6 on the street outside his home.

Dr. Dobbie, a private physician in Ottawa for many years, became assistant superintendent of the hospital in 1927 and was appointed superintendent in 1939, holding the post until 1942 when he resigned because of ill health. He was a graduate in medicine of Queen's University, 1915.

Survivors include two sisters, Miss Isobel Dobbie, of Victoria, and Miss J. Grace Dobbie, of Ottawa.

Dr. William Frederic Gardiner. Word has been received in Montreal on December 15 of the death of Dr. Gardiner, retired New York practitioner and native of Dundee, Que., at his San Diego, Cal., home in his 88th year.

The last of six sons, three of whom were members of the legal profession, Dr. Gardiner was born and raised on the family homestead at Dundee, now owned by a member of a Montreal law firm. His grandparents, with their families, came from Scotland, some of them settling in Montreal. Many of their descendants live here today.

Dr. Gardiner was a prominent physician in the Park Slope section of Brooklyn, N.Y., for many years. Retiring, he and Mrs. Gardiner lived for a time in Manhattan, later moving to San Diego. Burial was in Woodlawn cemetery, New York.

He is survived by his widow, Mary French Gardiner, formerly of Mexico, N.Y.; and three sisters, the Misses Ida A. and Edith A. Gardiner, both of New York City, and Mrs. Gertrude Wilson, of Southern Pines, N.C.

Dr. Thomas H. McColl, past president of the Provincial Medical Officers of Health Association, died in the Public General Hospital, Chatham, Ont., on December 14, of a coronary ailment after two weeks' illness. He had been in medical practice in Tilbury since 1903 the year of his graduation from the University of Toronto Medical Faculty. Born in Dunwich, Elgin County, he obtained his secondary education in Dutton and St. Thomas. He was chairman of Tilbury branch Red Cross Society, medical officer of health, chairman Memorial Park Board, held membership in Coronation Lodge, I.O.O.F., Tilbury Public School Board, and Chatham Rotary Club. His immediate survivors are his widow, the former Christina McAlpine, of Paynes Mills; a son, Capt. Thomas Duncan McColl, Canadian Army Dental Corps, Dartmouth, N.S., and a daughter, Mrs. F. G. Ruston, Tilbury, wife of Major Ruston, R.C.A.M.C., overseas.

Dr. Charles Fothergill McGillivray, who practiced medicine for the last 54 years in Whitby and district, died at the Oshawa General Hospital in his 88th year. He had been in frail health for the past year, but had not relinquished his practice entirely. He was a graduate of the University of Toronto 1890.

Dr. McGillivray was for some years secretary-treasurer of the Whitby School Board. For many years he was a member of the board of Whitby Ladies' College.

Born near Whitby, he received his early education there, and for a time taught school, latterly holding the position of principal of Fergus High School. Deciding to enter the field of medicine, he gave up teaching, and in 1890 graduated from the University of Toronto. Shortly after graduation he established a practice in Whitby. He was a member of the United Church.

Surviving are a son, George A. McGillivray, Toronto, and a brother, Dr. Donald McGillivray, Toronto.

Dr. Duncan Archibald McKillop, aged 85, who pioneered establishment of prevention methods for communicable diseases in St. Thomas, died on December 15. He was medical officer of health for 30 years before his retirement five years ago. He was born in West Lorne, and took his medical degree at the University of Western Ontario from which he graduated in 1894.

APPRECIATION OF THE LATE DR. WM. JAMES MCNICHOL

[*A short notice of the death of Dr. McNichol appeared in our January issue. We are indebted to his son, Captain J. W. McNichol for the following appreciation.*—EDITOR.]

In his younger days Dr. McNichol had one of the largest practices in the city and was one of Hamilton's best known medical men. During his long and active professional career, he made countless friends and the deceased was held in high esteem by all who knew him. It has been given to few men to possess a capacity for friendship equal to Dr. McNichol. Many will remember him for his kindly interest, his true devotion to duty, and his willing service for the welfare of others. He evinced keen interest at all times in various charities and generously supported all worthy causes always without ostentation.

Son of the late Thomas and Mrs. McNichol, of Westover, he was born in a log cabin on a farm at Westover. He attended Hunters Corners Public School and Dundas High School. After graduating from the model school for teachers at Hamilton, he taught school and it was an interesting event in his life when he returned to the little public school at Hunters Corners as teacher. After teaching for three years he entered the University of Toronto and graduated in 1898, and then took the examinations at the College of Physicians and Surgeons of Ontario, after which he graduated from the Post Graduate Medical School

and Hospital of New York City. He crossed the Atlantic to pursue special surgical work in London and Edinburgh.

Dr. McNichol was particularly known for his skill in surgery. It is of note, that he performed the first series of Cæsarean sections in Hamilton. He came to Hamilton to practice 46 years ago and remained there since. He was appointed a coroner in the County of Wentworth in 1897 and held that office until his death.

Dr. McNichol was one of the oldest members of the Hamilton Academy of Medicine and held the office of President in 1912. In recognition of his services he was made an Honorary Life Member of the Academy several years ago.

Dr. McNichol was a lover of art and was also well known as a curler. He was a member of the Thistle Club of Hamilton for many years and only recently was honoured with a Life Membership in the Club. He was a member and Past President of the Burlington Golf and Country Club. He was an adherent of Melrose United Church in Hamilton and in earlier years was prominent in several fraternal organizations.

Genuinely loved and respected, he leaves behind in the hearts of his confrères a deep sense of their loss.

Dr. Albert Fletcher Reynar, aged 77, medical practitioner at Palgrave, Ont., for 40 years, died on December 22, last. He graduated from the University of Toronto in 1896. For several years a village commissioner, he had given energetic campaigns to promote district road improvements and Hydro extension, and was one of the founders of Morningside cemetery. He was district coroner and medical officer of health for Albion township. Dr. Reynar was predeceased in 1936 by his wife, formerly Adeline Taylor, and in 1931 by a son, Hedley.

Dr. Wellington Howard Reilly, Montreal surgeon, died suddenly at his home, 451 Claremont Avenue, Westmount, on January 7 at the age of 69.

Born at Almonte, Ont., Dr. Reilly had been in partnership with his brother, Dr. William Reilly, for the last 25 years, and owing to the illness of the latter, he had carried on the practice alone for the past two years.

Dr. Reilly received his medical degree at McGill University and following his graduation in 1907 set up practice in Winnipeg. During the Great War he was assistant director of medical services at Military District No. 10, Winnipeg, with the rank of lieutenant-colonel. He came to Montreal in 1919.

Dr. Reilly was a consultant surgeon at the Montreal General Hospital, and a member of the Canadian Medical Association, the Montreal Medico-Chirurgical Society, and a Fellow of the American College of Surgeons. He was a member of St. Andrew's United Church, Westmount.

He leaves a widow, formerly Margaret Irene Douglass, two sons, Capt. Douglas H. Reilly, of the Canadian Medical Corps, now overseas, and LAC. John Reilly, R.C.A.F., stationed in New Brunswick, and his brother, Dr. William Reilly.

Dr. John Livic Robinson died in the Toronto Western Hospital on December 31, in his 69th year.

Dr. Robinson was born near St. Mary's, Ont., the son of John W. and Susan Emily Sims Robinson. He was educated in the schools of St. Mary's and graduated M.D., C.M., from McGill University in 1904. Prior to entering university he taught school in Oxford County. After two years' internship in the Montreal General Hospital he spent one year as medical superintendent in the Vancouver General Hospital. He then went to Waco, Texas, where he had a successful general practice. In 1917 Dr. Robinson returned to Canada, joined the R.C.A.M.C. and was appointed M.O. to the Polish troops in training at Niagara. For his services he received a decoration from President Paderewski. After a term on the staff of Christie Street Hospital he began general practice in Toronto.

Dr. Robinson was a member of the Masonic order, the Academy of Medicine, the Ontario and Canadian Medical Associations and the Paracelsus Club.

His funeral was held in Eaton Memorial Church of which he was a member and was largely attended by colleagues and a large number of people who had been his patients.

He is survived by his widow and two sons and a daughter. One son is Dr. Gordon Robinson now in the army and one brother is Dr. T. A. Robinson, of Toronto. Two brothers and three sisters also survive him.

Dr. Walter C. Shier died at his residence at Uxbridge, Ont., on December 10. He was a graduate of the University of Toronto of 1928. Dr. Shier carried on a general practice but also did considerable nose and throat work.

Dr. David Alexander Volume, a former president of the Kingston Branch of the Canadian Legion, died early in January at Bayfield, Ont., after a lengthy illness.

Dr. Volume, who attended Queen's University, completed his medical course at the University of Manitoba in 1908.

During the first Great War he served in Malta and Egypt. Following the close of the war he returned to Kingston, where he served on the staff of the Mowat Tuberculosis Hospital. He later accepted an appointment in the Leeward Islands in the British West Indies. He practiced at Southampton and Bayfield. His widow survives him.

News Items

Alberta

The annual elections in three medical districts for members of the Council of the College of Physicians of Alberta, held December 30, 1944, resulted as follows: Dr. S. N. Rose, Lethbridge, District No. 2; Dr. L. M. Rogers, Camrose, District No. 4; Dr. W. A. Lincoln, Calgary, District No. 6.

Recently, 31 students were graduated in medicine at the University of Alberta, in the accelerated course. After their hospital internships, most of them will be available for military service.

Alberta had nine health units established up to last year, but unfortunately only three of them had medical officers, owing to the number of men in the Forces. It is contemplated that for 1945, there will be six more units established; but most of them will go without medical officers for some time. In several of these units already established, scales have been furnished the schools and a great interest is manifested by the school children in keeping and checking their weights.

In the Crow's Nest Pass, there are three sets of coal mines comparatively near to one another, and there are three miners' hospitals to care for the injured workmen and the sick generally of the districts. There has been in contemplation for some time the erection of one up-to-date hospital to replace the old ones. The matter was submitted to the electors, and by a three to one majority, they voted for the new hospital which, when completed, will have sixty beds, and will be equipped with all the latest improvements. It is estimated that it will cost $185,000.

In the Drumheller mining area, the operators are offering cash prizes which may be drawn for by miners who have had no accident during a period. It is hoped that this will help in accident prevention.

Since industry bears all the expenses in connection with the Workmen's Compensation Board, there seems to be a tendency to make contracts with the doctors for definite sums paid monthly regardless of the number of accidents in the industry, and the type of accident which has occurred. The rate is lower than the amount a physician would receive, were his accounts presented to the Workmen's Compensation Board direct. G. E. LEARMONTH

British Columbia

The Division of Venereal Disease Control of the Provincial Board of Health has come to an arrangement by which there will be an increase in the rate of payment to private physicians for treating venereal disease cases who are indigent. This, of course, only applies where no clinic is operated, but will be of great interest to medical men practicing in other areas.

There is a fairly mild epidemic of measles in Vancouver at the present moment and the Medical Health Officer of the city, Dr. Stewart Murray, has issued a warning as to the necessity for more care on the part of parents in reporting this to their physician and keeping up proper measures to avoid pneumonia, and nose and throat complications, which have been quite prevalent. Too many cases are treated without any reference to a doctor.

A steady stream of medical officers is returning from overseas and being diverted into civilian practice. Amongst these are Captain W. S. Huckvale, R.C.A.M.C., who was wounded overseas, and has returned to Vancouver. Others are Captain W. H. Stockton, R.C.A.M.C., who was injured in an automobile accident in Italy; Flight-Lieut. G. A. Lawson, R.C.A.F.; Flight-Lieut. H. B. McGregor, R.C.A.F., who is resuming practice in Penticton following in the footsteps of his father, Dr. Herbert McGregor, who practised there for so many years, and who died over a year ago. Capt. P. S. Tennant, R.C.A.M.C., has returned to his practice at Kamloops, and we note too that Dr. F. R. G. Langston and his wife, Dr. Kathleen Langston, have returned to British Columbia. They spent several years in England.

The new Canadian Hospital Ship *Letitia* has many British Columbia doctors and nurses on its staff. This, which is acknowledged to be one of the finest hospital ships anywhere in the world, is now plying between the continents of Europe and America regularly. On its staff we note are Lieut.-Col. A. L. Cornish, of Victoria, Lieut.-Col. S. A. Wallace, formerly of Kamloops and Major J. E. Walker, of Vancouver. J. H. MACDERMOT

Manitoba

Dr. George H. Hamlin, Portage la Prairie, has been appointed coroner in and for the Province of Manitoba.

Dr. C. H. A. Walton, who recently returned to Winnipeg after nearly five years' service overseas, addressed the Winnipeg Scientific Club on December 12, on "Medical science in this war". He gave a vivid account of conditions in England and Italy and touched on the numerous factors which concerned the health and comfort of the troops. He attributed the low mortality among the wounded to improved transportation and the use of penicillin and plasma. Following his talk there was an animated discussion.

Dr. P. H. T. Thorlakson and Dr. H. Coppinger on December 21 addressed a meeting of reeves and councellors of municipalities adjoining Winnipeg on the proposed Medical Centre in Winnipeg. A resolution endorsing the scheme was carried unanimously.

Col. J. D. Adamson, of Winnipeg, consulting physician on the Headquarters Staff of Army Medical Services, was made President-elect of the Canadian Tuberculosis Association at the annual meeting. In his address reviewing the situation as regards tuberculosis in the army, Col. Adamson said that there had been only 26 deaths in the army due to tuberculosis. It was quite obvious he thought that the tuberculosis problem in World War II, thanks to x-ray examinations, was a relatively small one compared to that of the first World War.

Dr. W. S. Peters, of Brandon, and Dr. Paul H. T. Thorlakson, of Winnipeg, have been elected Fellows of the American College of Surgeons.

Major Charles Hollenberg, D.A.D.M.S., Aldershot, who was in charge of medical reinforcements for D-Day, received the O.B.E. in the King's New Year's Honours list. Major Hollenberg graduated from the University of Manitoba in 1932, practiced in Winnipeg until 1937 when he went to Britain for further study. He returned to Canada in 1940 to enlist in the R.C.A.M.C. and went overseas. He is now a surgeon in a Canadian Army hospital in Belgium.

Dr. A. G. Henderson, who was taken prisoner of war by the Germans when the *Zam Zam* was torpedoed in the Atlantic and who later escaped to France, has returned to his home in Winnipeg. He will take postgraduate work in the Winnipeg General Hospital.

As at December 18, 1944, Manitoba Health Service has 2,840 enrolled under the medical plan which gives complete coverage, and 738 under the limited surgical plan. ROSS MITCHELL

New Brunswick

Dr. Geo. W. Buchan, a consultant on the staff of the British Ministry of Health was the speaker at the monthly meeting of the Saint John Medical Society on December 3, 1944. Dr. Buchan spoke on "Public health in Britain in wartime" and sketched the present and proposed set up for Health Insurance in Britain, with special reference to the Beveridge Plan. Dr. E. A. Petrie was chairman.

Dr. H. A. Farris, of Saint John, was elected President of the Saint John Tuberculosis Association at the annual meeting in December.

Dr. R. M. MacLean, of McAdam, is reported somewhat improved in health and is now able to resume part of his practice.

The Commissioners of the Saint John General Hospital have greatly increased their supply of radium for use in the Tumour Clinic and Dermatology Department so that delays in treatment previously unavoidable will in future be obviated.

Dr. W. J. Baxter and Dr. F. J. Cheesman were recently granted temporary appointments on the indoor surgical staff of the Saint John General Hospital.
A. S. KIRKLAND

Nova Scotia

His many friends throughout Nova Scotia are welcoming Dr. B. F. Miller home from overseas. During his absence Mrs. Miller and their family have been living in Halifax. Dr. Miller is now a major in the R.C.A.M.C.

Major B. C. Archibald, who formerly practised in Glace Bay, and has been overseas with the 19th Canadian General Hospital, has recently returned to Canada where he still remains on active service.

Dr. Kenneth A. MacKenzie, of Halifax, is spending a short holiday in the United States.

Dr. H. W. Schwartz, Editor of the *Bulletin of the Nova Scotia Medical Society*, has been temporarily forced to discontinue his busy practice on the grounds of ill health. At the same time Dr. R. E. Mathers was ill. The illness of these two specialists placed an unusually heavy burden on the remaining eye, ear, nose and throat specialists in the city.

Dr. George Covert, of Halifax, is at present in New York undergoing treatment. His many friends wish him an early and complete recovery.

Dr. G. C. W. Bliss, of Amherst, and Dr. T. C. Lockwood, of Lockeport, both in their 87th year, are still in active practice. This is somewhat of a record even in a Province like Nova Scotia where a relatively high percentage of physicians are in active practice over the age of 65 years.

Amongst those recently receiving the Order of the British Empire is Lieut.-Col. J. Arnold Noble, of Halifax. Dr. Noble practised in Halifax prior to his enlistment at the outbreak of the war. He was promoted in the rank of Major in 1941 and to that of Lieut.-Col. in the following year.

Surgeon-Commander H. S. Morton, son of Dr. C. S. Morton, of Halifax, has recently received the Fellowship of the American College of Surgeons. Since joining the Royal Canadian Navy Dr. Morton has designed a portable orthopædic table and has made notable contributions to treatment in cases of fractures of the cervical spine, wrist and hand.

Dr. W. Alan Curry, of Halifax, was recently made a Fellow of the American College of Surgeons.

H. L. SCAMMELL

Ontario

We learn that the third prize of $200, in the Schering Award Competition, open to undergraduate medical students in the United States and Canada, has been awarded in duplicate to Norman Hirt, class of 1945, Queen's University.

The competition was on the subject of "Hormones and cancer" and a large number of manuscripts were submitted.

This award competition is offered annually by the Schering Corporation to stimulate interest in endocrinology amongst medical students.

November 1944 number of *Queen's Review* has an interview with Alfie Pierce trainer of football teams in Queen's for more years than he cares to admit. Asked to name the greatest footballer he had ever handled he at once answered "Teddy Etherington". It is another reminder that we were all young before we aged into dignified maturity. How few of his colleagues can imagine Dr. Frederick Etherington, Professor of Surgery, Dean of Faculty and "Minister of Justice" in the Council of the Ontario College of Physicians and Surgeons as "the original flying wing because he was always flying all over the place"! We look at him and wonder; but "Alfie" should know.

The Academy of Medicine, Toronto, has purchased a house near the Medical Arts Building. Moving has been forced upon the Academy by the expropriation by the government of the premises in Queen's Park in which the library has been housed for the past thirty years. The transfer of nearly thirty thousand volumes will be an expensive undertaking. Alterations in the new quarters will begin immediately.

The following appear in the King's New Year's Honour List as being made Officers of the Order of the British Empire: Colonel J. A. MacFarlane, E.D., and Lieut.-Col. E. H. Botterell, Toronto; Lieut.-Col. F. P. Lloyd, V.D., Cobourg, Ont.

M. H. V. CAMERON

Quebec

The following honours and awards have recently been made:

Colonel Herbert M. Elder, E.D., Montreal, has been awarded the Distinguished Service Order.

Colonel Clifford S. Thompson, and Lieut.-Col. Joseph P. La Plante, E.D., Montreal, have been made Officers in the Order of the British Empire.

Mentioned in dispatches for gallant and distinguished service are: Lieut.-Col. J. H. Palmer, Major Eric A. MacNaughton, Major L. J. Quinn, Captain J. A. Grant, all of Montreal.

The following awards in the King's New Year Honours List have been made:

Brigadier J. C. Meakins, Commander of the Order of the British Empire.

Colonel L. C. Montgomery, M.C., V.D., Officer of the Order of the British Empire.

Acting Surgeon-Captain Donald R. Webster, R.C.N.V.R., Officer of the Order of the British Empire.

Le Dr Paul Letondal, professeur agrégé à la Faculté de Médecine, pédiatre consultant à l'Hôpital Général de Verdun, a été élu président de la Société Médicale de Montréal, lors de la séance de fin d'année de cette Société, tenue le 19 décembre dernier. Les autres membres de l'Exécutif élus pour 1945 sont: le Dr Armand Frappier vice-président; le Dr Origène Dufresne secrétaire général; le Dr Jean Denis secrétaire des séances; et le Dr Edouard Desjardins.

Fondée en 1900, incorporée en 1929, la Société Médicale comprend plus de 500 membres. Elle est la plus ancienne et la plus importante Société de médecine, à Montréal, chez les Canadiens-Français.

Son but est de maintenir et d'intensifier, au sein de la profession médicale, le goût de l'étude et de la recherche scientifique, et partant, de contribuer au développement de la Médecine Canadienne.

L'hôpital St-Luc de Montréal a élu récemment les officiers suivants pour l'année 1945: *Exécutif du Conseil médical*—Président, Dr. J. A. Fleury; Vice-président, Dr J. H. Charbonneau; Secrétaire, Dr R. Grondin; Membres, Drs C. Denis et D. Longpré. *Conseil médical*—Président, Dr E. Garceau; Vice-président, Dr R. Lallemand; Secrétaire, Dr Alphonse Bernier. *Bureau médical*—Président, Dr René Major; Vice-président, Dr Yvon Vallée; Secrétaire, Dr Paul Morin; Secrétaire des séances scientifiques, Dr L. P. Desrochers.

Le Dr J. A. Rouleau a été nommé chef du service de médecine de l'Hôpital Notre-Dame. Le Dr Rouleau remplace le Dr A. Léger, décédé.

Quinze villes de la province n'ont pas eu un seul décès dû à la diphtérie pendant trois ans. Ces villes sont: Drummondville, Granby, Grand'Mère, Longueuil, Lachine, Outremont, Verdun, Westmount, St-Hyacinthe, Trois-Rivières, Valleyfield, Lauzon, Montmagny, St-Jérôme et Victoriaville.

Mgs A. J. V. Piette, ancien resteur de l'Université de Montréal est mort subitement au cours du mois dernier.

JEAN SAUCIER

Saskatchewan

Medical officers are gradually being released for civilian practice. Among those recently obtaining their discharges are Colonel Beattie Martin, who returned to Regina on October 3 after extensive service overseas; Dr. J. H. Hutchison who has been with the R.C.A.F. since 1942 and formerly practiced at Wilkie, has accepted a position as Medical Officer with the Alberta Workmen's Compensation Board with offices in Edmonton; Dr. C. F. W. Hames who is now Medical Officer with the Department of Public Health at Regina, has been discharged after five years of service in R.C.A.M.C.; Colonel B. C. Leech who also enlisted in 1939, re-opened practice in Regina on December 1; Major A. J. McDougal who has been with the R.C.A.M.C. since 1941 has returned to civilian practice; and Dr. A. E. Whitmore who received his discharge some months ago is now practising at Turtleford.

The profession of the Province will be sorry to know that several of their confères are on the sick-list. Dr. A. W. Argue has been a patient in the hospital for some months and is at present in the Regina Grey Nun's Hospital, but it is hoped by the time this is read he will be back on the job. Dr. A. E. Ross, of Saskatoon, was admitted to the City Hospital recently with a heart condition. Dr. E. B. Alport, of Regina, is taking a much needed rest. And Dr. H. C. George, of Regina, is a patient at Fort San.

On October 4 the defence department announced promotion to rank of acting Lieut.-Col. for Major M. D. Mitchell, R.C.A.M.C., of Maple Creek, who has been camp medical officer at Chilliwack, B.C. He has been appointed to command Shilo camp military hospital and to be camp medical officer at Shilo camp in Manitoba.

Captain Lillian A. Chase, who has been stationed for some time in Regina, has been transferred to Toronto.

Major E. J. deBeaupre, of Hawarden, has been appointed officer commanding No. 12 Company, R.C.A.M.C., Regina.

Winners of the golf trophies at the Annual Medical Convention in September were Captain H. M. Bigelow, of Regina, the Regina District Medical Society Cup; and the Saskatoon District Medical Society, the Mead Johnson Cup by virtue of being the only District to enter a team. The team was Drs. J. J. Finn, of Dundurn, A. Croll, R. H. MacDonald, and H. D. Dalgleish, of Saskatoon.

Dr. T. F. Waugh, formerly of Leroy, Sask., has now taken up residence in Victoria, B.C. Dr. A. M. Clare, formerly Langenburg, is located at Neepawa, Manitoba. Dr. J. M. Macdonald who has been practising at Mazenod, is now at Freemont. Dr. S. E. Burnham, of Eastend, is living in Phoenix, Arizona, and Dr. G. Robinson has left Moose Jaw to return to Vancouver.

Dr. L. Boluboff is re-opening a practice in Saskatoon after being with the R.C.A.M.C. two years. Dr. E. W. Spencer is returning to civilian practice after four years with the R.C.A.M.C. Dr. Spencer was with No. 8 Canadian General Hospital unit, overseas.

The monthly meeting of the medical staff of St. Paul's Hospital in Saskatoon was held on October 19. The program consisted of "A case of hydronephrosis complicated by syphilis", by Dr. F. W. Rosher; "Ileus with complications", by Dr. R. H. MacDonald; "Coarctation of the aorta", by Dr. D. M. Baltzan; and "Interesting x-rays", by Dr. R. D. Johnson.

Dr. H. A. Hengen, formerly of Grenfell, has taken over the practices of Dr. B. W. Hargarten and Dr. R. G. Yoerger at Humboldt. Dr. Hargarten has opened a practice in Saskatoon and Dr. Yoerger is residing at the Pacific Coast. Dr. Harriet I. Houston has re-opened a practice at Bethune. Dr. F. D. McDade has returned to the Province and is located at Bengough. Dr. I. M. Shankman who practiced for some time at Lampman is now at Arcola. Dr. G. R. Hancock, who was associated with Dr. Routledge, of Unity, has located at Red Deer, Alberta. Dr. C. H. McCreary left the Freemont district in favour of Ituna.

There have been three new registrants since last reported, Dr. Joseph H. Duncan, of Saltcoats, Trinity '93, who comes to us from Alberta; Dr. Werner Bergmann, of Meadow Lake, Amsterdam '39, who also comes via Alberta; and Dr. George F. Kipkie, of Regina, Queen's '39.

Dr. O. K. Hjertaas has been granted a local permit to practice in Wauchope and district until the next meeting of Council.

The 1944 election for members of the Council for Medical Electoral Districts Nos. 2, 4, 6, and 8, resulted in all former Council members being returned by acclamation. Representing M.E.D. No. 2, Dr. J. J. Hamelin, of North Battleford; No. 4, Dr. C. J. Houston, of Yorkton; No. 6, Dr. B. M. Bayly, of Moose Jaw; No. 8, Dr. M. H. McDonald, of Weyburn.

Dr. Archie MacDonald, who practised for many years at Ceylon, Sask., has retired and is now living at 3035 Rae Street, Regina.

Dr. E. B. Alport, of Regina, and Dr. R. H. MacDonald, of Saskatoon, attended the Convention of the Royal College of Physicians and Surgeons held at the Chateau Laurier, Ottawa, on October 27 and 28. Dr. Fred Woolhouse, of Saskatoon, now a Medical Officer with the R.C.N., was a successful candidate, by examination, in surgery.

The Auxiliary of the U.C.T. of Saskatoon have the honour of organizing a local unit of the Canadian Society for the Control of Cancer. This is the first unit organized under any provincial Society in Canada. The meeting was held on October 20, 1944. Along with the officers of the local U.C.T. on the platform were M. F. G. Butterfield, President of the provincial body; Dr. Allan W. Blair, Director of the Regina Cancer Clinic. His Worship, Mayor A. W. McPherson, occupied the chair, while other prominent men included Prof. E. A. Hardy and President J. S. Thomson of the University were present.

The officers of the newly organized unit are: President—J. F. Marlow; Vice-president—Prof. E. A. Hardy; Secretary-Treasurer—C. Benson; Executive members—Mrs. H. E. Pfeiffer, Mrs. A. Lyons, Dr. G. R. Peterson, Dr. A. B. MacDonell, W. S. Little, C. A. B. MacRury.

Mr. T. C. Miller, Senior Counsellor of the Saskatoon Council of the U.C.T., presented the President of the Unit a cheque for the sum of $1,000. The U.C.T. as a body are to be congratulated on their undertaking to carry on the educational work of the Society.

H. D. HART

General

Social Hygiene Day.—Canada will observe its second annual national Social Hygiene Day February 7.

Sponsored by the Health League of Canada in co-operation with the federal and provincial departments of health, the "Day" is being set aside to re-focus attention on Canada's No. 1 public health problem—venereal diseases.

Lieut.-Col. D. H. Williams, in charge of venereal disease control for the three armed services and chief

of the Division of VD Control of the Department of National Health and Welfare, recently told a Montreal audience that the problem had become acute in the Dominion and that it was imperative for every Canadian to co-operate in the destruction of the scourge.

He said venereal diseases could not be defeated on the medical front alone while three other main fronts —legal, welfare, and moral—were left open.

Col. Williams said that unless stern action were taken, Canada, after the war would be faced with a plague of venêreal diseases that would sweep the country.

Through observance of Social Hygiene Day, the Health League hopes to reinforce public interest in the never-ceasing fight waged by various governmental and voluntary agencies. The "Day" actually marks the opening of another intensive campaign against these insidious diseases which can cause devastating results to individual communities and to a nation at large.

Hospitals Approved for Graduate Training in Surgery.—The American College of Surgeons announces that 231 hospitals in the United States and Canada have been approved for graduate training in general surgery and the surgical specialties. The list of approved hospitals for this purpose is published in the annual Approval Number of the Bulletin of the College just issued. As a result of the 1944 survey, nine additions to the Approved List were made compared with last year.

The hospitals in Canada which are approved for graduate training in surgery are as follows:

ONTARIO

Name of hospital and location	*Capacity*	*Approved for graduate training in*
Toronto		
Hospital for Sick Children	432	General surgery
St. Michael's Hospital...	643	General surgery
Toronto General Hospital	1,144	General surgery, obstetrics and gynæcology
Toronto Western Hospital	518	General surgery
Montreal		
Montreal General Hospital	607	General surgery
Central Division...	450	otolaryngology
Western Division.	157	
Montreal Neurological Institute*		
Royal Victoria Hospital..	550	General surgery,
Montreal Neurological Institute		otolaryngology, urology, obstetrics and gynæcology, neurological surgery
Royal Victoria Montreal Maternity Hospital		
Royal Victoria Maternity Hospital*		

* See Royal Victoria Hospital.

The U.S. Army Medical History of the War.—According to a report from Colonel Albert G. Love, historian of the U.S. Army Medical Department, plans have been made to complete the medical history of World War II six months after victory in the Pacific. Several officers are now assigned to the historical program, approximately half of them serving in overseas theatres. Most of these officers hold graduate degrees in history from leading universities throughout the country. They were commissioned in the Medical Administrative Corps following completion of training in Officer Candidate Schools. These officers are working on the administrative aspects of the medical service including supply, personnel, training, and hospital construction. The professional medical experience of the Army will be recorded by medical officers especially qualified in various specialties.

By means of this well-manned staff, the history of the medical department in the current conflict should be completed within the time limit set by Colonel Love. Previous histories published by the medical department appeared several years after the cessation of hostilities. Twenty-three years were required to complete the medical history of the Civil War; ten years to complete that of the first World War. Early publication of the current history will be advantageous in that many of the administrative and scientific advances in military medicine will be applicable in planning for national defense and civilian practice. Thus the things which the Army is learning today on the world's battlefronts—improved methods of collection and evacuation of the wounded with prompt treatment, better medical and surgical care, the use of new drugs and appliances, control of communicable diseases, advances in reconditioning—are destined to reach the public domain while the knowledge acquired by the Army is still fresh.

At a meeting of historical officers held in the office of the Surgeon General on December 6, announcement was made that sufficient volumes would be published to cover the entire scope of the Medical Department's professional and administrative work. Material for the series of volumes is rapidly accumulating from installations in this country and overseas. Colonel George R. Callender, Director of the Army Medical School, stated that excellent reports on missile casualties have been received for the volume on wound ballistics covering several campaigns.

Book Reviews

A Method of Anatomy, Descriptive and Deductive. J. C. B. Grant, Professor of Anatomy in the University of Toronto. 3rd ed., 822 pp., illust. $7.00. Williams & Wilkins Co., Baltimore, University of Toronto Press, 1944.

Dr. Grant again deserves much praise for his attempt to lift the study of Anatomy from the level of a tedious tax upon the memory to a plane where deductive thinking gives new life to the subject. In this third edition, the method has been improved, and many of the rough spots in the earlier editions have been smoothed over. Not the least among the many recommendations of this book is the fact that the subject, including pertinent embryological and histological material, is knit together in one volume, obviating the necessity to go from text to text in search of facts.

The lucid simple diagrams and figures have been noted in reviews of earlier editions. In the present volume, in many cases these have even been improved. A word of special praise is due Mrs. D. I. Chubb who has contributed most of the new illustrations. Her integration of line into the interpretation of form and texture is beautiful.

The book is of inestimable value to students, particularly if their teachers of anatomy follow its outline and method; it is too long and complete within itself to be used successfully as supplementary reading in a course that follows some other method. It is also the best that can be recommended at present to practitioners and upper year students wishing to revise the subject, although for these we hope that Dr. Grant may some day find time to write an abbreviated version, with perhaps a little more extension of his method into the study of the head and neck. Because of the continuity of the reasoning in each chapter, the book is hardly a quick source for particular data; however, that was not the aim of the author. This third edition, even better than its predecessors, still stands out as an entirely different and valuable approach to the study of anatomy.

The Neurosurgical Patient. His Problems of Diagnosis and Care. C. W. Rand. 576 pp., illust. $5.50. Thomas, Springfield; Ryerson Press, Toronto, 1944.

In this book, Professor Rand has drawn together a series of clinical talks from meetings and lectures at the School of Medicine in Los Angeles. Each chapter is prefaced by a clinical review of a case illustrative of the topic under discussion.

Dividing his theme into four sections, Professor Rand begins with Traumatic Lesions of the Spine. Several interesting congenital anomalies are illustrated as well. Then follow several chapters upon the various injuries of the spine and spinal cord. In the above sections the stress is laid chiefly on diagnosis. No new treatments are discussed, but there is an interesting chapter upon the management of the patient with complete section of the spinal cord. The next section on Head Injuries commences with general reviews of the common injuries and their treatments. Post-concussional states are dealt with, particularly the functional neuroses following accidents. Some rarer conditions such as traumatic encephalitis are presented. Alterations of the visual fields are discussed with clarifying diagrams. Many uncommon brain tumours are presented with case histories. In the final miscellaneous section, Professor Rand deals with common controversial conditions affecting the central nervous system. Of particular interest is the chapter on Amputation Stump Neuromas—Phantom Limb, a condition which will become more marked on the return of wounded service men. There is a discourse upon the newest theories and latest treatments of malignant hypertension, including interesting figures on results from sympathectomy. In general, the book offers if not the latest theories, at least those most widely accepted and proved. Possibly not a reference book, for it is too personalized, but certainly well worth reading.

Principles and Practices of Inhalation Therapy. A. L. Barach. 315 pp., illust. $5.00. Lippincott, Montreal, 1944.

Inhalation therapy is becoming more and more recognized as an important armament in the fight against disease, both in rural and urban centres. This timely book by Barach should be much appreciated by the medical profession. It gives a detailed description of the pathological physiology of the respiratory organs in the different diseases with instructions as to the method and type of inhalation therapy which is indicated in each. The methods of treatment and the different appliances used in inhalation therapy are described in detail. This allows the physician to become familiar with each and to be fitted to choose the most suitable equipment available and use it efficiently. However, the actual difficulty of administering the gas to very ill or unco-operative patients has not been discussed, and this is a real problem in inhalation therapy. The administration of helium and oxygen and other gases under positive pressure opens a wider field in inhalation therapy and its more general and intelligent use as described in this handbook, will give relief to many in respiratory distress.

As many of our boys are in the Air Force, the chapter on acute altitude sickness makes us appreciate the problems that have had to be mastered by the Forces' medical and technical personnel. Much of the recent data are given. The various pitfalls and possible toxic effects of oxygen therapy are noted and the need for further research work is emphasized.

Although the pathological physiology may seem rather elementary to a well trained physician, the majority will find it a refreshing and needed review, and it will be of inestimable value to technicians and nurses. On the whole, the book is very practical and should be placed at the disposal of all who are interested in inhalation therapy.

Psychiatry and the War. A Survey of Psychiatry and its Relation to Disturbances in Human Behaviour to Help Provide for the Present War Effort and for Post War Needs. Edited by F. J. Sladen. 505 pp. $6.75. Thomas, Springfield; Ryerson Press, Toronto, 1944.

It would be unfortunate if the title of this excellent book were to restrict its circulation. Here in one volume is a comprehensive collection of mature judgments from men long experienced in different fields offering a system of philosophy of life to the public in all walks of life. It is in no way a textbook of psychiatry as commonly understood. One could not learn the nature and treatment of the psychoses from it. Technical phraseology is at a minimum, and the prevention of both neuroses and psychoses is the theme of all contributors, the fitting of the individual to his job, or the choice of a job for the individual. The various contributions are written in an easy and charming manner that should entertain as well as instruct. Most valuable is an article that would profit, not only pædiatricians, but parents. Religion is recommended in a form helpful for solving modern problems. What articles deal with naval, military, or aviation problems could be applied in civil life with all its complications and one feels impressed by the conclusions drawn by recognized authorities from their long experiences.

The book might well be introduced into private and public libraries, as well as into medical libraries.

X-ray Examination of the Stomach. F. E. Templeton. 516 pp., illust. $10.00. University of Chicago Press, 1944.

This is an exceptionally well illustrated book covering all phases of the x-ray diagnosis of normal and abnormal conditions of the œsophagus, stomach and duodenum. The opening chapter on apparatus discusses the filming fluoroscope in detail with special reference to the apparatus used at the University of Chicago. Considerable space is given to the method of examination of these organs with consideration of anatomical, physical and physiological factors which affect them. The author has correlated with roentgenological diagnosis of lesions symptomatology and findings noted at gastroscopical examination at operation and at post mortem.

The work includes a complete discussion to the finest detail of all phases of roentgenological diagnosis of this region along with complete reference to the writings of other workers. This is a book for specialists in radiology which will stand for many years as a milestone in roentgenology of the upper gastro-intestinal tract.

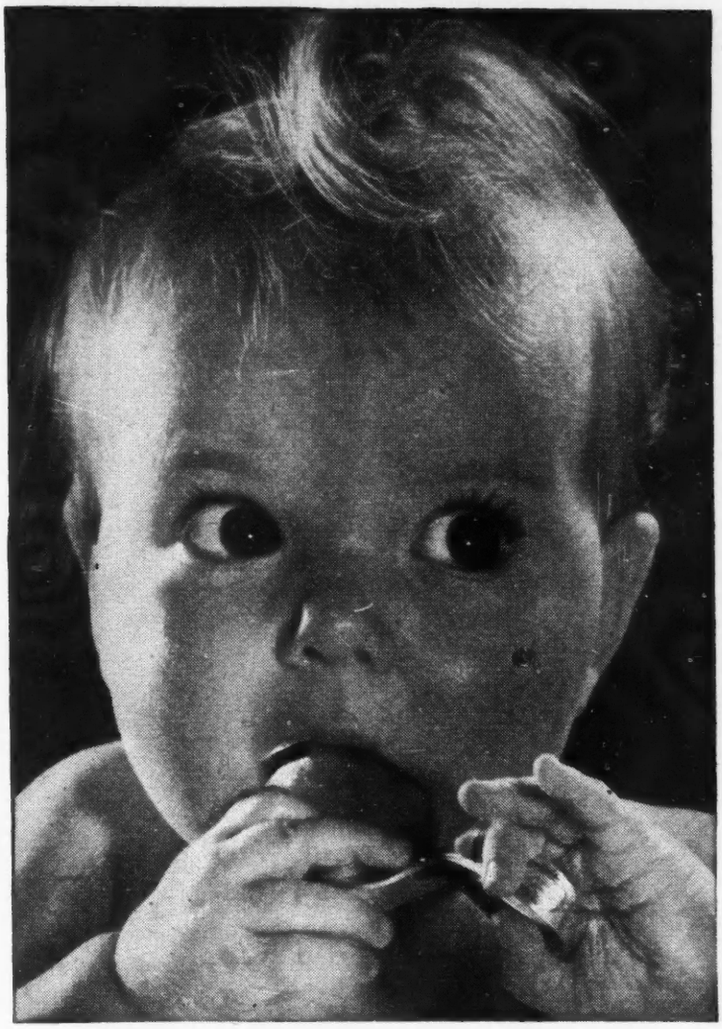
Varicose Veins, Hæmorrhoids and Other Conditions. R. R. Foote. 119 pp., illust. 12s. 6d. H. K. Lewis, London, 1944.

This is an excellent monograph for students and surgeons interested in injection methods. The illustrations are numerous and excellent; the technique equally well treated and the complications scientifically discussed.

Part 1 deals with the ideal sclerosing agents, the anatomical approach to high saphenous ligation and discusses the reasons for failures. Static ulcers can be healed by ambulatory pressure dressings combined with sclerosis of the feeder varix. The plea for careful follow-up is made.

Part 2, hæmorrhoids, discusses the anatomy of the hæmorrhoidal plexus and warns against injecting third degree intero-external hæmorrhoids. Sclerosing solutions indicated are all useful and satisfactory.

Parts 3 and 4 refer to injection treatment of hydrocele. It favours operative treatment of hernia and varicocele rather than injection methods. Ganglion nævi and anal fissures when treated by injection respond favourably. Injection of an anal fissure will



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Mosquito Control. Practical Methods for Abatement of Disease Vectors and Pests. W. B. Herms and H. F. Gray. 2nd ed., revised, 419 pp., illust. $3.50. Commonwealth Fund, New York, 1944.

The first edition was published in 1940 but since then it has been reprinted four times. The second edition is a great improvement on the first. It has a broader application and considerable attention has been paid to the needs of the Services. The most recent advances in control methods have been included and an appendix on how to use entomological keys has been added; no keys are included, however. It is well written, especially for men engaged in mosquito control and postulates little previous training in the subject. At this time when mosquito-borne diseases such as malarias, filarias and dengue fever are so extremely important, a book such as this becomes invaluable.

The Gastro-Intestinal Tract. A Handbook of Roentgen Diagnosis. F. J. Hodges, Professor of Roentgenology, University Medical School, Ann Arbor, Mich. 320 pp., illust. $5.50. Year Book Publishers, Chicago, 1944.

This is one of a series of handbooks and as such is printed in a convenient size 6 by 8¼". The book is profusely and well illustrated and the text is so arranged that while reading on the left hand page the illustrations are directly opposite on the right hand page. The six sections are listed under the following titles: (1) Œsophagus; (2) Upper Gastro-intestinal Tract; (3) Biliary Tract; (4) Colon; (5) Abdomen generally; (6) Findings of particular interest. An introductory chapter is included discussing the methods of examination with particular emphasis on the manner of employing the fluoroscope. The author also includes a catalogue of x-ray diagnoses for the gastro-intestinal tract which has been used in the University of Michigan for recording x-ray findings so that they are readily available for review, and there is a most interesting discussion on the usual x-ray findings of the gastro-intestinal tract along with case reports of unusual cases.

While this work covers practically all important details of the findings associated with the intestinal tract, the text has been purposely kept brief so that it is readily read and understood. The book would be excellent for undergraduate students in roentgenology and in the author's own words, "Every effort has been made to illustrate the story of gastro-intestinal roentgenology without slighting the commonplace or overemphasizing the unusual. Above all, the desire to present the subject in a manner most useful to physicians who are not, and who do not intend to become specialists in the field of roentgenology has governed the selection and arrangement of material."

Fertility in Men. F. S. Hotchkiss. 216 pp., illust. $4.25. Lippincott, Montreal, 1944.

Fertility in Women. S. L. Siegler. 450 pp., illust. $5.50. Lippincott, Montreal, 1944.

These two volumes are issued simultaneously in a single cardboard container and represent the efforts of a urologist and a gynæcologist to cover the field of human fertility. The keynote of both is their clarity and sanity. The authors state their case in clear, concise language, and they make no ridiculous claims. The evidence for and against the various tests and therapeutic measures are fully and fairly summed up. They cover the field, but do not hide it with detail. Essentially these volumes are for the specialist, but every surgeon who performs dilatations of the cervix and ventro-suspensions on women who have not conceived, would benefit by reading them.

In *Fertility in Men* the various tests of the semen are clearly described and easy to follow, but this volume has two illustrations, Figs. 32 and 33, showing apparatus for estimating the metabolism of the spermatazoa, that occupy valuable space without adding to the body of truth. Both authors deal very comprehensively with endocrine deficiencies and endocrine therapy, and their estimation of the value of the latter is in modest—and welcome—relief to the extravagant claims made so often in current medical literature. These volumes show the tremendous amount of time and patience that may have to be given to the investigation of infertile matings before a final diagnosis can be made, and before a woman—or man—may fairly be subjected to any surgical treatment. For their size they must be two of the best books on the subject now available.

Biblographic Index of Leprosy. (Indice Bibliografico de Lepra). Vol. 1, A-H. Edited by L. Keffer, Librarian, Library of the Leprosy Prevention Department of the State of Sao Paula, Brazil, 674 pp., 1944.

This is an extremely comprehensive bibliography of leprosy. It is really a copy, properly arranged, of the special file of the Library of the Leprosy Prevention Department of Brazil. The book was undertaken some 10 years ago and is not yet complete. As a reference source on leprosy it is unequalled.

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